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TWENTY-NINTH CONVENTION OF THE PACIFIC COAST FIRE CHIEFS

AUGUST 9-12, 1922

AND GOLDEN ANNIVERSARY CONGRESS OF INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS

AUGUST 15-18, 1922

JAMES ROLPH, JR.
Mayor of San Francisco
Honorary Member Veteran Firemen's Association

THE MAYOR'S WELCOME

For many months the people of San Francisco have looked forward to the double convention of the International Association of Fire Chiefs and the Pacific Coast Association of Fire Chiefs, and to you, delegates to this important gathering, I extend the warmest welcome.

We of San Francisco realize how vital to all of us is the matter of fire prevention. We know of the fact that fires in the United States mean an annual loss of $500,000,000 and a yearly sacrifice of 20,000 lives. To you, in your campaign of education on the subject of fire prevention, we pledge our full co-operation.

There is a lighter side to conventions, also, and for this we have long been preparing. We hope so to greet you, so to entertain you, that you will return again and again during the years to come to the City by the Golden Gate.

Sincerely,

JAMES ROLPH, JR.,
Mayor of San Francisco.

August, 1922.

THOMAS R. MURPHY,
Chief Engineer San Francisco Fire Department,
Host to the Convention.

Pacific Coast Association of Fire Chiefs

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1921--1922

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FRANK G. REYNOLDS,
President International Association of Fire Engineers.

International Association of Fire Engineers

OFFICERS

1921--1922

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New Jersey.....W. H. Ingold
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Newfoundland.....A. S. Stalker
Nova Scotia, Can.....J. W. Churchill
Ohio.....J. H. Speddy
Oregon.....J. E. Young
Oklahoma.....W. A. Shoat
Ontario, Can.....Wm. Russell
Pennsylvania.....R. B. Davis
Quebec, Can.....E. Berthiaume
Rhode Island.....A. J. Cote
South Carolina.....W. J. May
South Dakota.....J. B. Mayo
Saskatchewan, Can.....J. E. Faithfull
Tennessee.....B. L. Warlick
Texas.....S. D. O'Connor
Utah.....G. A. Graves
Vermont.....C. D. Stockwell
Virginia.....C. C. Meador
Washington.....F. L. Stetson
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PROGRAM

Pacific Coast Association of Fire Chiefs

Wednesday, August 9th:

9:30 A. M.	Convention called to order by President A. J. Trodick. Invocation by Rev. Fr. Oliver A. Welsh, C. S. P. Song by Firemen's Quartet. Address of Welcome by His Honor Mayor James Rolph, Jr. Vocal Solo. Response by Chief Wm. Bywater. President's Address.
11:00 A. M.	Memorial Service by Rev. Walter J. Sherman, Central M. E. Church.
11:45 A. M.	Recess.
11:50 A. M.	Official picture to be taken in front of Auditorium.
12:00 M.	Ladies taken to lunch by Ladies' Committee.
2:00 P. M.	Afternoon session.
5:30 P. M.	Recess.
7:00 P. M.	Evening session.
8:00 P. M.	Entertainment in Larkin Hall of Auditorium.

Thursday, August 10th:

9:00 A. M.	Morning session.
10:00 A. M.	Ladies' ride over city and lunch.
11:00 A. M.	Visit to Exhibition, tests and demonstrations.
7:00 P. M.	Evening session.
8:00 P. M.	Fire prevention talks, moving pictures and entertainment and dance in Larkin Hall of Auditorium.

Friday, August 11th:

9:00 A. M.	Morning session.
10:00 A. M.	Ladies' shopping tour.
12:00 M.	Recess.
1:30 P. M.	Afternoon session.
2:15 P. M.	Recess—Baseball game.
8:00 P. M.	Boxing at Dreamland Rink.
8:00 P. M.	Dance at the St. Francis Hotel.

Saturday, August 12th:

9:00 A. M.	Morning session. Election of officers. Selection of 1923 convention city.
10:00 A. M.	Sightseeing tour for ladies.
12:00 M.	Adjournment.

PROGRAM—Continued

California State Association of Fire Chiefs

Saturday, August 12th:

1:00 P. M. First annual meeting at the Colonial Room of the St. Francis Hotel, President Jos. Schneider, of Riverside, presiding.

6:00 P. M. Reception by the Pacific Coast Association of Fire Chiefs to the Delegates to the Golden Anniversary Convention of the International Association of Fire Engineers, at the Colonial Room of the St. Francis Hotel.

Sunday, August 13th—MARIN COUNTY DAY.

Monday, August 14th—PENINSULA DAY.

International Association of Fire Engineers

Tuesday, August 15th:

8:45 A. M.	Delegates will be conducted from the St. Francis Hotel to the Convention Hall.
9:45 A. M.	Band and organ concert at the Convention Hall.
10:15 A. M.	Convention called to order by President Frank G. Reynolds. Invocation by the Most Rev. Archbishop J. Hanna. Song by Firemen's Quartet. Address of Welcome by His Honor Mayor James Rolph, Jr. Vocal solo. Speaker for Firemen of the West, Mr. Louis Byington. Speaker for Women of the West, Mrs. E. J. Mott. Response by Chief Sherwood Brockwell. Vocal solo. President's address.
11:15 A. M.	Memorial service by Rt. Rev. W. F. Nichols, Bishop of the Episcopalian Diocese.
12:00 M.	Recess.
12:10 P. M.	Official picture to be taken in front of Auditorium.
2:00 P. M.	Afternoon session.
5:00 P. M.	Recess.
8:00 P. M.	Grand parade and historical pageant.

Wednesday, August 16th—OAKLAND DAY:

9:00 A. M.	Assemble at ferry for trip to Oakland. Automobile ride through Oakland and Berkeley.
12:00 M.	Luncheon at Idora Park.
3:00 P. M.	Ride to University of California. Session in the Greek Theater in honor of visiting foreign chiefs. Address by Prof. Frank Probert, Dean of the School of Mines, U. C., on "Gases".
6:00 P. M.	Dinner at Hotel Oakland.
10:30 P. M.	Return trip to San Francisco. Night demonstration of fire boat on the bay.

Thursday, August 17th:

9:00 A. M.	Round table discussion.
10:00 A. M.	Recess.
10:15 A. M.	Exhibitors' tests and demonstrations, including a demonstration of the San Francisco high-pressure system.
2:00 P. M.	Visit to high-pressure pumping stations, followed by automobile ride over the city.
7:00 P. M.	Banquet and ball at the Colonial and Italian ball rooms of the St. Francis Hotel.

Friday, August 18th:

9:00 A. M.	Final business session. Reports of committees. Election of officers. Selection of 1923 convention city.
2:00 P. M.	Sightseeing trips.
8:00 P. M.	Trip through Chinatown.

San Francisco's Fire Department

San Francisco's Fire Department

THE Fire Department of San Francisco was organized at the close of the year 1849. The city, then little more than a mining camp, but flourishing and growing in population by leaps and bounds through the influx of gold-seekers and adventurers from all parts of the world, was visited by a disastrous fire on Christmas Eve of that year, and nothing but smoldering ashes were left of what had been the business center of this bustling community. Under the guidance of Mayor Geary and other influential citizens, meetings were called the following day, and the establishment of an organized fire department was gotten under way.

In the Days of the Volunteers.

Frederick D. Kohler was appointed chief engineer. Three hand fire engines, which had been brought around Cape Horn from the East, formed the equipment of the new department, and the first three companies were called the San Francisco, Empire, and Protection. Although to this soon was added newer and costlier equipment, and the city's best manhood joined the volunteer forces, the year 1850 was marked by a series of fires more disastrous than the first, owing primarily to the scarcity of water. Eventually a number of fire cisterns were constructed and supplied with water pumped from wells.

Chief Kohler retired in August, 1851, and was succeeded in that office by the

following: Frank E. R. Whitney, George H. Hossefros, Charles P. Duane, James E. Nutman, Frank E. R. Whitney (second term), and David Scannell. The membership roll contained 916 names, although some of these had retired from active service in the department.

The year 1866 saw the passing of the old Volunteer Department, which had grown in size to comprise fourteen engine companies, three hook and ladder companies and five independent hose companies. Four of the engine companies had steam fire engines, and one of these, Pennsylvania No. 12, had its engine drawn by horses. The others all were worked by hand.

On December 2, 1866, the new Paid Department was inaugurated under Chief Frank E. R. Whitney. This was composed of a board of five commissioners consisting of five members, a chief engineer, two assistant engineers, one corporation-yard keeper, six steam fire engine companies, each of which having a foreman, one engineer, one driver, one fireman and eight extra men; two hook and ladder companies, each having a foreman, one driver, one tillerman and twelve extra men; three hose companies, each having a foreman, one driver, one steward and six extra men.

San Francisco Business Section.

Under this system, all but the extra men were required to devote their entire time to department duties. The extra men could work at other occupations, but were obliged to drop their work when alarms were sounded and respond with their companies to the scene of the fire. Compensation was meager and disclipine rigid. A band of incendiaries, apparently beyond the control of the police, taxed

the department to the limit, and political machinations kept it in a constant state of turmoil for a period of years.

David Scannell again became chief of the department in 1871, and, excepting a short term, remained at the helm until his death. He won the esteem and confidence of the community through his ability as a fireman and a leader. At the age of 73 he died, literally "in harness," and was succeeded by Dennis T. Sullivan, then first assistant engineer.

Dennis T. Sullivan.

Chief Sullivan assumed command of the department in 1893, and it soon became evident that he was fully equal to the task. A fireman of the highest ability,

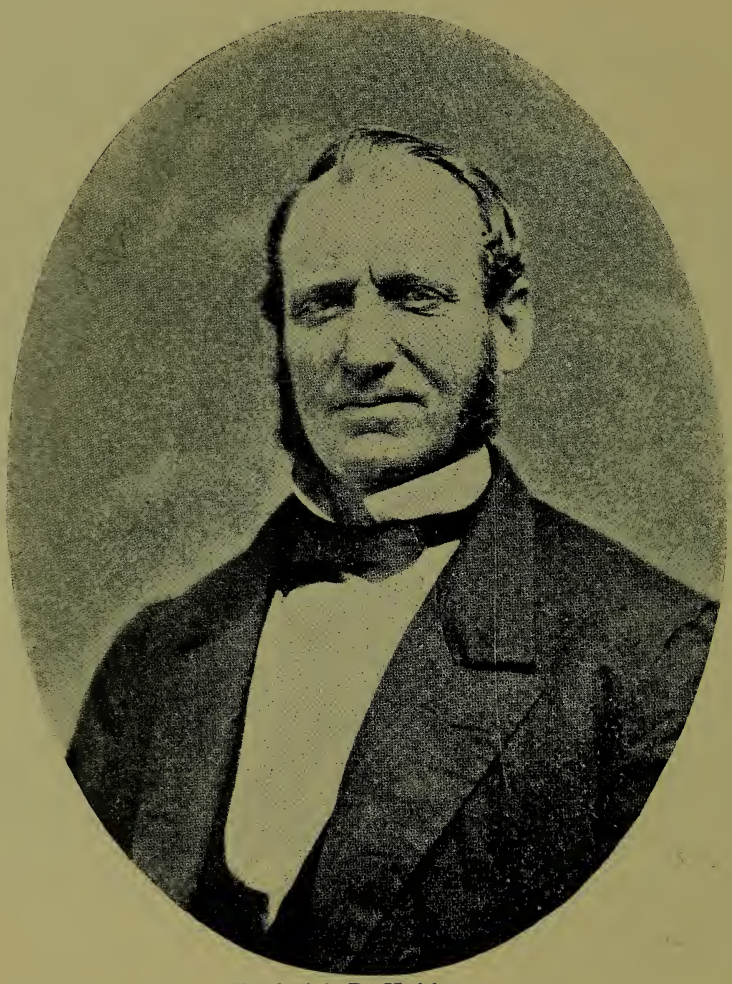
Frank E. R. Whitney.

of untiring devotion to his duty, and a firm disciplinarian, his leadership brought the department to a very high standard of efficiency.

On January 8, 1900, a new city charter reorganized the department upon a "fully paid" basis; the former system of extra men, or "call men" as they had commonly been called, was done away with, and all officers and members had to devote their entire time and attention to their duties in the department. It had grown in size to comprise thirty-six engine companies, eight hook and ladder companies, seven

chemical engine companies, one water-tower and two monitor batteries. Civil service replaced the former methods of determining the fitness of candidates for appointment and promotions in the department, and provisions were made for pensions of half pay for disability, and after twenty-five years of service in the department, or twenty years of service, if the applicant has reached the age of fifty-five years.

A modern fire alarm system had been installed, water mains with fire hydrants attached thereto had displaced the old-time fire cisterns, which latter were, despite Chief Sullivan's recommendations to the contrary, and in face of his repeated warnings, were allowed to fall prey to time, and had become entirely useless. The equipment and appurtenances of the department, on the whole, were thoroughly modern and in good condition, and the personnel of the department, under the able guidance of its chief, had attained a well-merited reputation for efficiency.



Frederick D. Kohler.

On the morning of April 18, 1906, the city was visited by a severe earthquake shock, which, unfortunately, claimed as one of its first victims the man upon whom the city's reliance was placed in just such an emergency. Chief Sullivan, asleep in his headquarters, situated on Bush street, near Kearny street, was in-

jured so severely by the falling of a cupola from the roof of an adjoining building, that he succumbed to his injuries four days later. Deprived of its leader and immeasurably handicapped by the lack of water, as the mains conducting the supply of water to the city had been ruptured beyond immediate repair at a considerable distance outside of town, and the supply stored within the city reservoirs soon wasted through the innumerable breaks in the distributing mains, the department vainly struggled to control the fires which immediately started simultaneously in more than fifty different locations. Within two hours fifteen hundred soldiers from the Presidio, under Brigadier-General Frederick

Funston, arrived to render all possible aid, but the fire raged for four days before it was finally subdued. A portion of the waterfront was saved through the combined efforts of the firemen, sailors and soldiers, and mostly on account of the water which was pumped from the bay by tugboats equipped with pumps. Blasting with gunpowder and dynamite, as well as backfiring, was promiscuously resorted to, but the progress of the conflagration was not stopped until it had reached Van Ness avenue to the westward, a thoroughfare one hundred feet in width. The actual loss in lives and property has never been ascertained, although the Chamber of Commerce has estimated the property loss at $350,000,000.

But, as in former disasters, the spirit of San Francisco's citizens again asserted itself, and long before the ashes had cooled the rebuilding of the city was begun. Profiting by the lesson, a fire-protection system designed to prevent the recurrence of a similar catastrophe, was installed, together with a large number of fire cisterns of reinforced concrete, each capable of holding 75,000 gallons of water. The department itself recovered from the effects of the earthquake as rapidly as could be expected. John Dougherty, first assistant chief under Chief Sullivan, temporarily succeeded him as chief, but, being well along in years, he relinquished the reins to Patrick H. Shaughnessy, who was appointed chief engineer on June 15, 1906. Temporary structures were hurriedly erected to house the apparatus, as a majority of the fire houses had been destroyed by the fire, and during the reconstruction period the department had to contend with numerous fires caused by the flimsy construction of the many temporary buildings.

David Scannell.

On March 16, 1910, Chief Shaugh-

nessy was retired, and Thos. R. Murphy, the present chief, assumed command of the department. A disciple and ardent admirer of the late Chief Sullivan, the new chief, then only forty years old, brought with him a thorough knowledge of his duties, a sincere desire to give his city as efficient a fire department as it was humanly possible to attain, and an unlimited amount of energy and enthusiasm. The installation of the high-pressure system was proceeding rapidly, and as each section was completed it was immediately placed in service. Motor apparatus, which by now had passed the experimental stage, began to replace the horse-drawn equipment early in 1912, and the motorization of the department was pressed so energetically that, notwithstanding the great amount of equipment needing replacement, and the retarding effect of the World War, the task was completely accomplished in 1921.

Quarters of Engine Company No. 12 at Drumm and Commercial Streets, fifty years ago and today.

The equipment now in service consists of four motor-propelled steam fire engines, thirty-five gasoline pumping engines, thirteen motor-propelled hook and ladder trucks, four motor-propelled straight hose-wagons, ten motor-propelled combination chemical engines and

hose-wagons, twelve motor-propelled straight chemical engines, one motor-propelled water-tower, two fireboats, ten chiefs' cars, and, in addition, a number of pieces of motor apparatus for relief purposes.

A Bureau of Fire Prevention and Public Safety was established through an ordinance of the Board of Supervisors in 1921. The chief engineer of the fire department is the ex-officio chairman of this bureau, which has charge of the enforcement of fire prevention laws and regulations. It is under the direct supervision of a battalion chief, who has under him a force of inspectors from the uniform rank of the department. Regular inspection of all buildings are made, and proper compliance with safety regulations is enforced.

Horse-drawn apparatus, now displaced by modern motor equipment.

A history of the San Francisco Fire Department would not be complete without reference to the Panama-Pacific International Exposition of 1915. Built in the northern section of the city, upon the shore of the bay, it contained, almost en-

tirely within non-fireproof structures, treasures worth untold millions. The fire losses during this exposition, including the period of construction and dismantling were less than $250. The organization charged with protecting this vast undertaking from fire, although paid by the management of the exposition company, was a part of the San Francisco Fire Department, experienced men from the city forces having been exchanged with the new men employed by the corporation, the unit thus formed being under the direct supervision of the chief engineer of the San Francisco Fire department.

Engine Company No. 12.
Hose Tender for Fire Boat.

SAN FRANCISCO

Squad Wagon

Hose Tender for Fire Boat

Motor Propelled Hook and Ladder

Chemical Engine

Pumping Engine & Hose Wagon

Engine Co #25

Engine Pumping from Cistern

Combination Pump and Hose Wagon

The Central Fire Department

THE Central Fire Alarm Station is located on the center of Jefferson Square, a public park. Its isolation from all other buildings makes it immune from the dangers of a general conflagration. It is a class "A" reinforced concrete building, approximately 65 feet square, with metal doors and sash, and of fireproof construction throughout. There are two floors. On the main floor are located the entrance vestibule, the operating room, telephone exchange, chief operator's office, buffet, locker rooms and lavatories. The basement contains the battery room, store room, engine room, heater room, dormitory, dressing room, shower bath and lavatory, and large open hall which contains the main distributing frame and the underground cable pit.

The operating room is 48 by 64 feet in size. The switchboard is a combined vertical and bench made up of four different kinds of marble. The vertical portion of the board contains the major portion of the equipment, the bench contains the registers and silencing keys. The switchboard forms a perfect semicircle, 29 feet in radius. At the center of this semicircle is located the central control desk, a beautiful piece of Verdi antique and blue Vermont marble.

The station is manually operated and the switchboard contains three main groups of circuits in the present installation: tapper circuits, joker circuits, and signal circuits. Provision is made for a fourth group of circuits, consisting of automatic, non-interfering reporting circuits from the engine houses.

The alarm is received over the signal line and transmitted to the engine houses over the tapper and joker lines. There are two fire alarm operators on watch at all times—a relay operator who operates and handles all incoming signals, and a key operator who handles all the outgoing signals.

All circuits enter the building through underground cables and terminate on one side of a cross-connecting rack located in the basement. From the opposite side of the cross-connecting rack, circuits are carried to their respective positions on the switchboard in cables supported in metal racks located near the basement ceiling. Each circuit is equipped with a line switch, line fuses and vacuum type protector located on the main switchboard.

Each signal or box line consists of a closed circuit on which an average of fifteen street boxes are connected in series. The signal line central office equipment consists of a milliammeter, a Morse key on each side of the line, two line relays (one on each side of the line which operates a switchboard indicating lamp), a sounder, a register and a locking box list lamp which stays lit until released by the operator. By means of the locking box list lamp it is impossible for an incoming box to be overlooked in the case of four or five boxes coming in practically at the same time.

The tapper and joker lines are practically duplicate circuits as far as equipment in the central office is concerned. Each circuit is equipped with a line switch, line fuses, vacuum protector, voltmeter ground testing key, rheostats, and two line relays. One relay is wound to 20 ohms and the other, or closed circuit relay, is wound to 500 ohms.

A closed test current of 20 milliamperes is kept on the line which operates the 500-ohm closed test relay, but not the 20-ohm relays in engine houses. Signals are sent

to the engine houses over the tapper and joker lines by impressing 240 volts direct current, which gives a current of approximately 250 milliamperes.

Each panel contains four circuits which derive their source of current supply from a dynamotor. The dynamotor sets are run from one of a duplicate set of storage batteries; one set is standing idle or in reserve while the other set is in service. The battery in service is floating directly on the out direct current through a reserve current; inverse time element relay disconnects the outside source in case of failure and allows the office dynamotors to run without interruption on the storage battery.

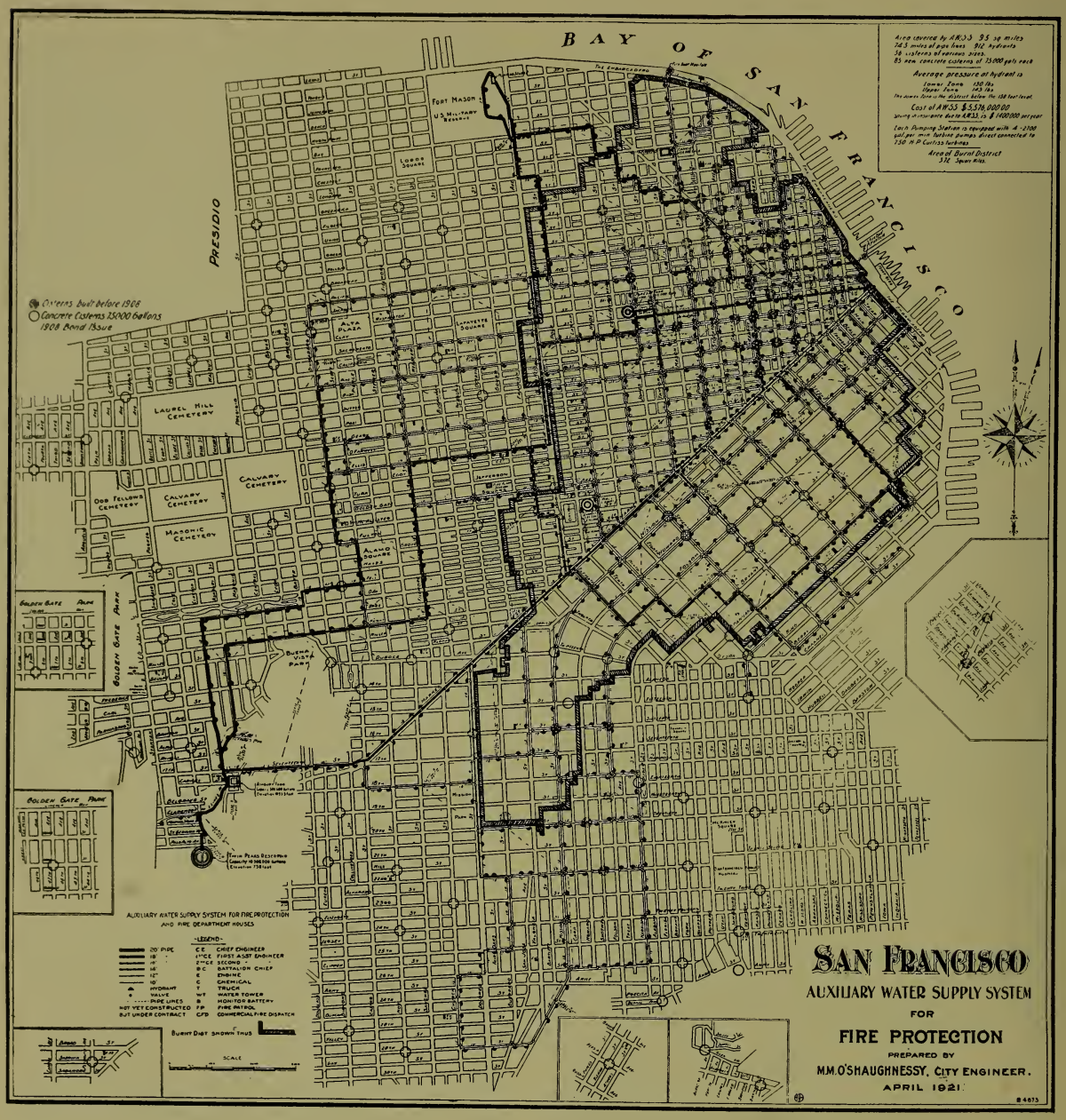
As stated above, one of the main storage batteries is at all times standing in reserve, and in case of a complete shutdown or failure on the part of power companies the office can run seventy-two hours before it is necessary to recharge the batteries.

The office has normally five sources of current supply—four from the power companies, and an engine generating plant in the station. In case of complete failure of the power, the office can be run indefinitely, providing distillate or gasoline is available.

The station is at present equipped for forty-eight signal circuits, but has available space for an ultimate of eighty circuits. The entire equipment, with the exception of the registers, milliammeters and switches, was manufactured and installed by the Department of Electricity.

Jefferson Square Park.

Interior Views Central Fire Alarm Station.



The Auxiliary Fire Protection System of San Francisco was designed by the foremost engineering experts with a view to preventing the recurrence of a catastrophe similar to that which visited the city in 1906. It embodies every known principle of safety, and thoroughly covers not only the section of the city which was then destroyed by fire, but also reaches out into the residential territory. In addition to the reservoirs, distributing mains and pumping stations, there are a number of reinforced concrete underground cisterns, each holding 75,000 gallons of water.

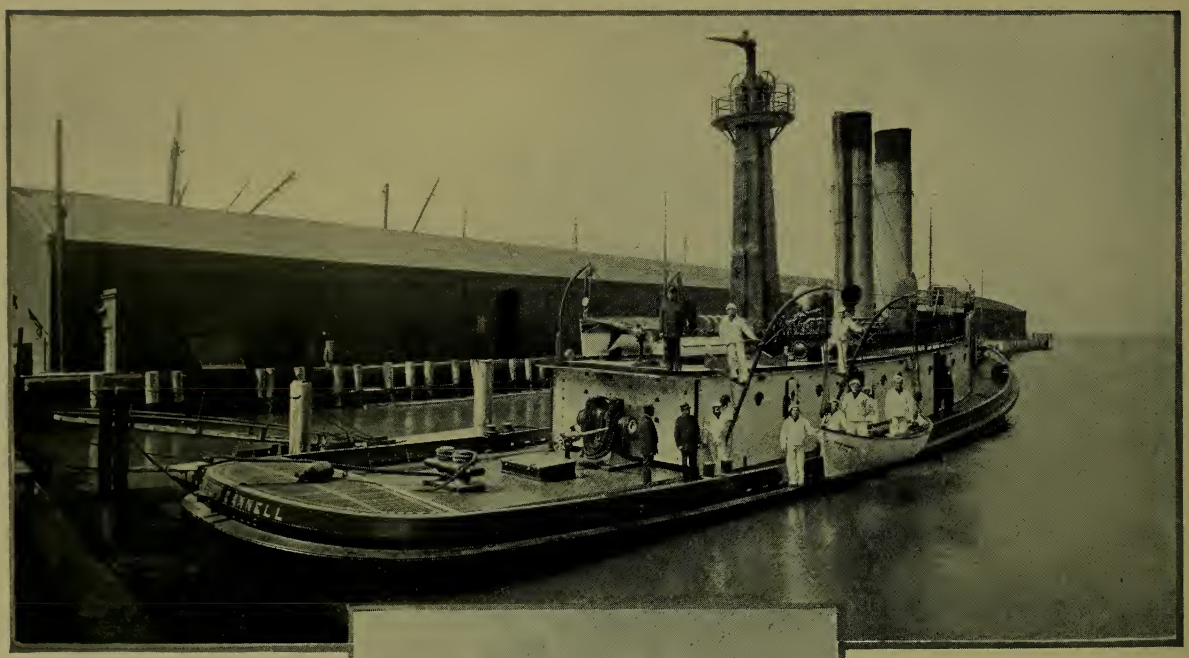
San Francisco's Two Fire Boats

SAN FRANCISCO'S two fire boats, the *"Dennis T. Sullivan"* and *"David Scannell,"* while independent fire-fighting units, were built as and form part of the city's Auxiliary Fire Protection System. Completed in 1909 at the plant of the Risdon Iron Works, a San Francisco Shipbuilding firm, at a combined cost of $279,618.61, they embody all the modern features of vessels of this type, and are well able to protect the greatest harbor on the Pacific Coast.

The two vessels are sister ships, each having the following dimensions: Length over all, 129 feet; beam, 26 feet; moulded depth, 12½ feet; draft, 11 feet. They are provided with twin screws, each being driven by a cross compound vertical condensing engine of the inverted cylinder type, with cylinders 13 and 28 inches in diameter, respectively, and with a common stroke of 21 inches. Under 180 pounds steam pressure each engine will develop about 400 indicated horsepower at 135 revolutions per minute. Each boat is fitted with two boilers of the water-tube type, each having a heating surface of 2770 square feet, and designed for a working pressure of 200 pounds per square inch. The pumps are of the multi-stage turbine type, driven by steam turbine engines. There are two sets of pumps in each boat, capable of delivering 10,000 gallons of water per minute against a pressure of 150 pounds, or 5000 gallons per minute against a pressure of 300 pounds.

Each boat has, mounted amidships, a water tower capable of being extended to a height of 70 feet above water level, and fitted with a revolving nozzle with tips ranging in size from 2 to 3 inches. This has been found a very valuable feature, as it permits of a powerful stream of water being directed into the holds of a burning vessel, the hull of which may be towering high above the deck level of the fire boat and, even though it may not be possible to station men on the deck, these streams can be regulated either from a platform about 40 feet above water level, or from the deck of the fire boat. In addition, there are two large-sized batteries, one mounted amidships and the other atop of the pilothouse, and two smaller ones which are portable and may be connected in various locations along the main deck. While there is deep water along the entire shoreline which forms San Francisco's waterfront, their shallow draft enables them to navigate in shallow water and they have on many occasions been called to other sections of the vast reaches of San Francisco Bay. To illustrate this point it may be cited that on one occasion one of the boats made an uninterrupted trip to Sacramento, the State Capital of California, a distance by water of 125 miles, in something like 10 hours. This trip, however, was not made in response to an alarm, but to demonstrate to the State authorities that these boats are a valuable and necessary asset, not only to the City of San Francisco but to the whole bay region.

Permanent manifold connections are located at accessible places along the waterfront, through which either or both of the two boats may pump salt water into the mains of the High Pressure System. This arrangement widens their radius of effectiveness to include all the territory served by the mains of that system, the limits of which are distant more than 3 miles from the waterfront.



Fire Boat in Action.

Fire Boat in Action.

Fire Boat in Action.

San Francisco Fire Boat Views

San Francisco's Fire Chief's Home

The City of San Francisco, in appreciation of faithful service, has erected a handsome residence on Bush street, near Taylor street, for use of the Chief Engineer of the Fire Department. The building is a memorial to the late Chief Dennis T. Sullivan, who lost his life during the earthquake of 1906, and the bronze tablet and other memorial features of the structure were supplied by the Dennis T. Sullivan Memorial Committee from a fund collected for the purpose of perpetuating the memory of the late Chief.

No fire apparatus other than the Chief's official car is housed in the building, but room is also provided for a private machine on the apparatus floor. A sleeping room for the Chief's operators and an office for the Chief are located on the ground floor. The entire second floor is given over to the Chief's private residence, and several additional sleeping rooms are located on the third floor. The building is modern throughout and forms a fitting testimonial to the present Chief and to his successors in the future.

San Francisco Fire Chiefs' Home.

The Thos. H. Ince Trophy
For Fire Prevention

During the year 1919 a group of prominent Pacific Coast Fire Chiefs journeyed to the Ince Studio at Culver City for the purpose of enlisting the co-operation of Mr. Ince in fire prevention matters. They secured his pledge to make a three-reel fire prevention picture, which was subsequently made and shown throughout the entire United States. At the same time the question of a trophy for fire prevention contest was discussed, and Mr. Ince agreed to donate a thousand-dollar silver cup, into which the Fire Prevention Bureau of the Pacific was to place two hundred and fifty silver dollars, this cup to be awarded annually to the city making the best record in fire prevention, with the understanding that when the cup had been won a third time by any city it will remain there permanently.

During the year 1920 the cup was awarded to the City of Anaconda, Montana—Chief Chas. Collins. During the year 1921 the cup was awarded to Piedmont, California—Chief Walter Culver. Supplementing the cup in this contest, the Governors of the several Pacific Coast States, during 1921, donated a silk American flag to be given to the city in their respective States making the best record in fire prevention. These flags were won by Pasadena, California; Newberg, Oregon; Montesano, Washington; Warren, Arizona; Nampa, Idaho; Winnemucca, Nevada; Helena, Montana.

San Francisco's Water Supply

San Francisco's High Pressure System

ONE of the lessons brought home to the citizens of San Francisco by the destruction by fire in 1906 of property valued in excess of $350,000,000 was the need of an auxiliary high-pressure system for fire protection, which has since been installed at a cost of $5,750,000. The system comprises the Twin Peaks Reservoir, at an elevation of 750 feet, with a storage capacity of ten and a half million gallons; the Ashbury Tank, a 500,000-gallon steel tank situated on Clayton street near Seventeenth street, at an elevation of 490 feet; a reinforced concrete tank of 750,000 gallons' capacity at Jones and Sacramento streets, at an elevation of 360 feet; 74.5 miles of extra heavy cast iron distributing mains ranging from ten inches to twenty inches in diameter, and connected to 912 hydrants.

Twin Peaks Reservoir.

Two pumping stations built on bedrock, one at Second and Townsend streets and one at Fort Mason, with a combined capacity of 24,000 gallons per minute at 300 pounds pressure per square inch; 141 underground cisterns, 85 of which are newly constructed, of reinforced concrete and having a capacity each of 75,000 gallons, and the balance repaired or reconstructed brick cisterns; two fire boats for the protection of the waterfront, as well as being capable of delivering salt water through specially designed manifold connections into the mains of the auxiliary high-pressure system.

Every practicable safeguard against damage by earthquake was incorporated into the design of this system. Heavy construction was used throughout. The pumping stations were established on solid rock, and each connected by two separate feeders to the distributing system. Gatevalves at frequent intervals permit cutting out damaged sections of pipe. A special type of pipe-joint gives added flexibility in the filled-in areas, which are subject to ground settlement.

Contrary to a widespread belief, the system and all its reservoirs are filled with fresh water, in order to prevent rapid deterioration of the mains, which

would quickly result from the use of salt water therein.

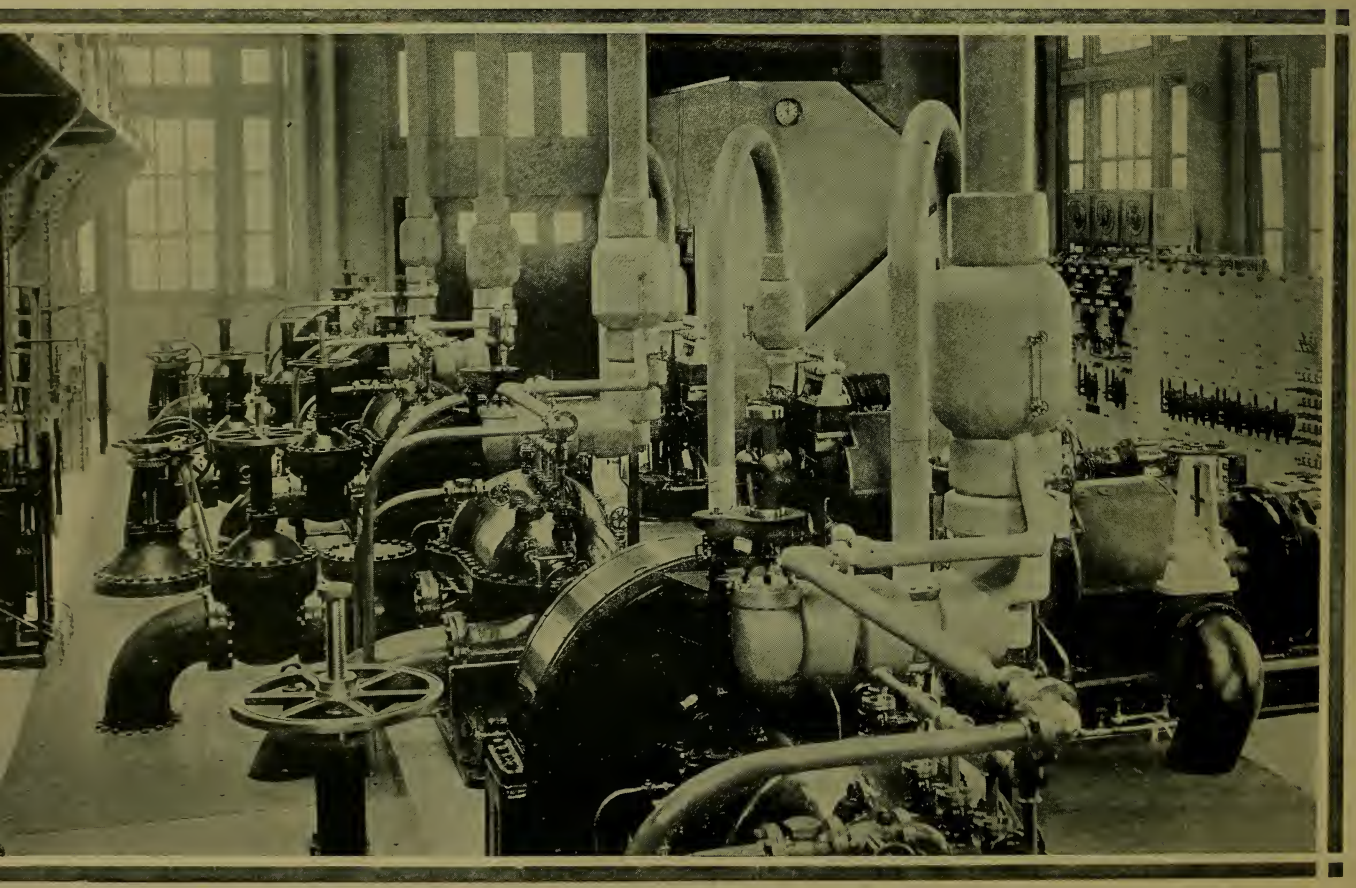
Each of the two pumping stations has a full operating force constantly in attendance, and supply of fuel and fresh water sufficient to operate the plant at full capacity for a period of seven days. A constant watch of attendants at the various storage tanks is also maintained, so that in the event of need the pressure in the two zones may be increased at a moment's notice.

While designed and installed as an auxiliary fire protection system, and not intended to displace the pumping engines of the department in any particular section of the city, it is being constantly operated at all larger fires occurring in the district protected by it, and has demonstrated its efficiency.

High Pressure Pumping Station No. 2, Fort Mason.

Test of High Pressure System, Market and Kearny Streets.

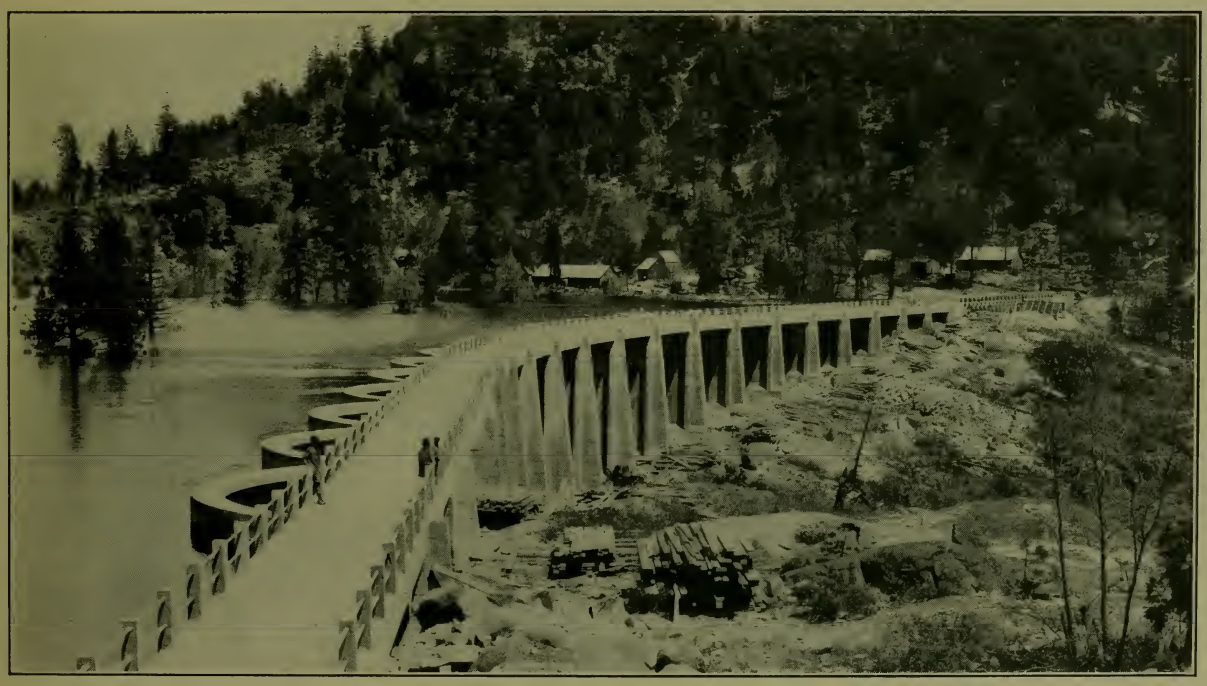
High Pressure Hydrant.



Interior of High Pressure Pumping Station.

The Hetch-Hetchy Water Supply

WITH a view to ultimate acquisition by the city of all its public utilities, San Francisco is engaged in the construction of a water supply designed to ultimately yield 400,000,000 gallons daily of pure mountain water. The project takes its name from its principal reservoir site, Hetch Hetchy Valley, which is eighteen miles on an air line, northwest of Yosemite. In addition to furnishing this abundance of water, so essential to the physical and business welfare of the community, this same water passing through huge water-wheels installed in electric power plants will generate 200,000 horsepower for general use in central California.



Lake Eleanor Dam. The spring flood each year fills the reservoir behind the dam, and later the stored water is released to operate the power plant at Early Intake during the dry months.

The Hetch Hetchy dam is now under construction and will be completed in February, 1923. In its initial development this dam will be 226.5 feet high above the original stream bed, or 344.5 feet above the lowest point in its foundation. It will contain 360,000 cubic yards of masonry, and the reservoir will have a capacity of 67 billion gallons of water. Ultimately, the dam will be raised 85.5 feet, making the total height of the dam 430 feet and giving a storage capacity of 113 billion gallons. Second in importance to the Hetch Hetchy reservoir will be the Lake Eleanor reservoir and dam. Here a dam has been built across the outlet of the lake, and the water thus impounded is used to operate the power plant at Early Intake during the dry season, when the normal supply from Cherry River fails. This plant furnishes power for the construction machinery on the Hetch Hetchy work, and power generated in excess of the city's construction

requirements is sold to the Pacific Gas and Electric Company; more than $200,000 has already been received from such sales. Lake Eleanor can be developed to a capacity of over 50 billion gallons, should the growth of the city require this additional supply.

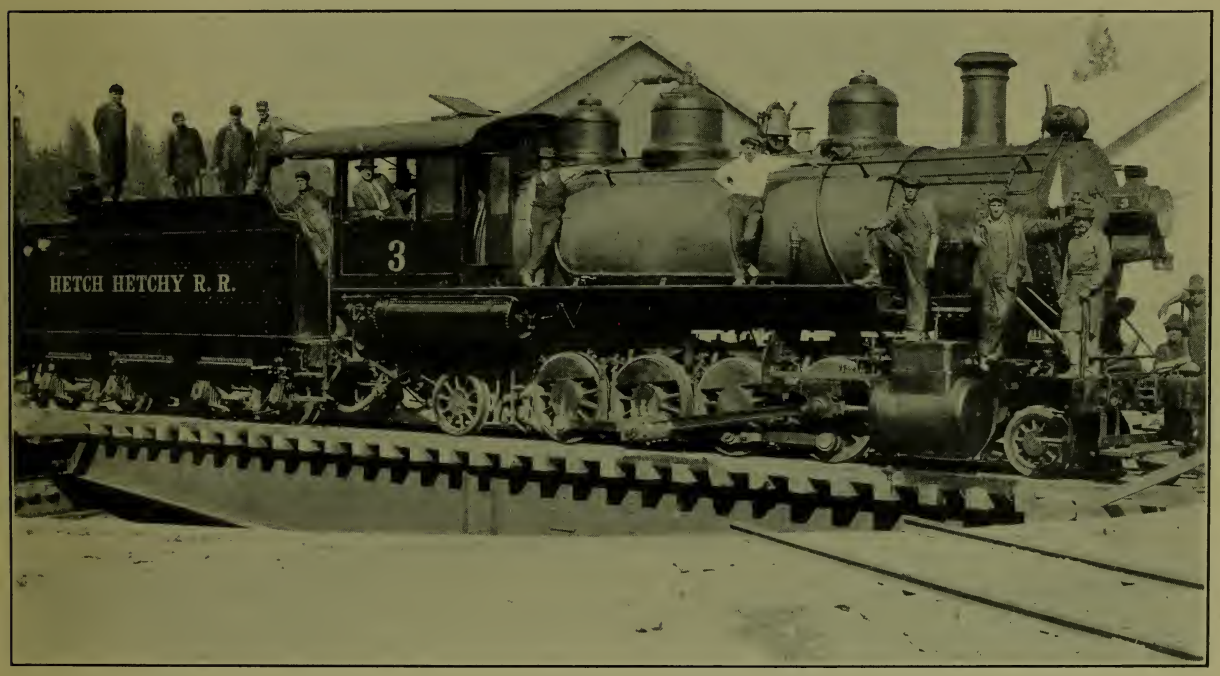
To carry the water from the Hetch Hetchy reservoir the bed of the Tuolumne River will be used for a distance of twelve miles to Early Intake, where a diversion dam will turn it into the aqueduct. This aqueduct from Early Intake to Priest is under construction and will be ready for service late in 1923. It includes 18.3 miles of tunnels of a minimum size of 10 feet 3 inches in height and width. About eleven miles of these tunnels will be lined with concrete. At Priest the water will be discharged into the Priest regulating reservoir, from which the Moccasin Creek power plant will take water, affording opportunity to develop an average of 70,000 horsepower. After passing the power plant the water will enter another tunnel through the Sierra foothills, seventeen miles in length, and terminating at Oakdale portal, just east of the San Joaquin Valley. Forty-five and two-tenths miles of large steel pipes will then conduct the water across the San Joaquin Valley from Oakdale Portal to Tesla Portal, eight miles east of Tracy. The next division, 31.5 miles in length, will penetrate the Coast Range to the Irvington gate house, all in tunnel

Hetch Hetchy Reservoir as it will appear when the dam is completed and the reservoir filled with water.

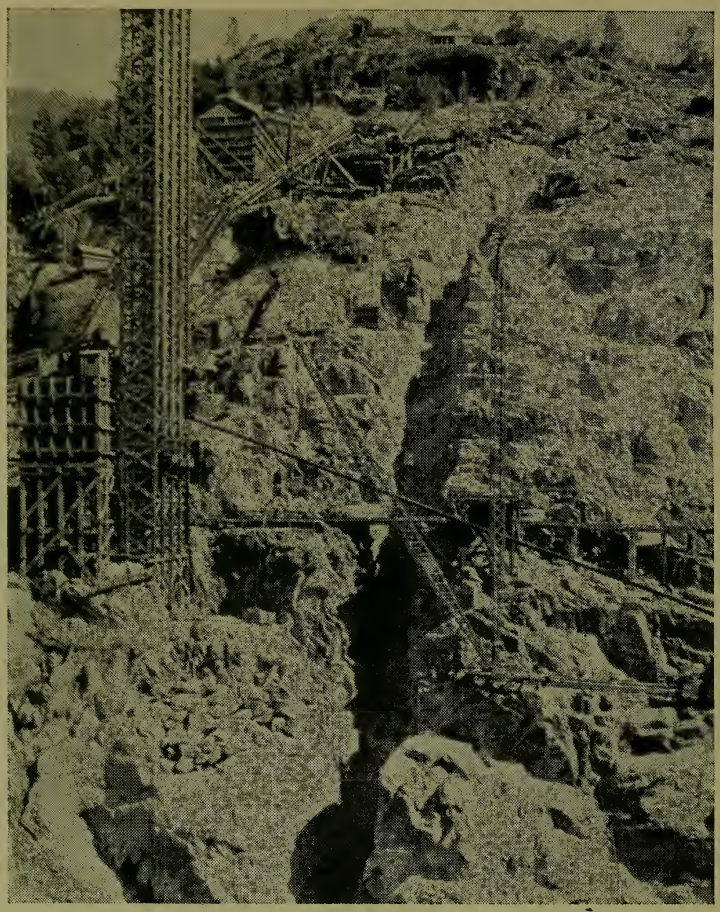
excepting 3200 feet of steel pipe crossing the valley of Alameda creek. At Irvington gate house the water will be apportioned to the three main divisions of the metropolitan district. The principal branch will continue westward to San Francisco, the second will extend northwesterly to the east bay cities, and the third southwesterly to San Jose.

The San Francisco branch of the conduit crosses the low land bordering the bay of San Francisco with nineteen miles of steel pipe, not far from the existing pipe of the Spring Valley Water Company, crossing the southern arm of the bay at Dumbarton, and ending in the hills west of Redwood City. Then comes thirteen miles of tunnel running beneath the backbone of the ridge between the bay and the Spring Valley Lakes. A two-mile steel pipe will syphon the water across the low ground near Baden, and the final three miles of tunnel will bring the water into the city. Land just inside the county line, east of Mission street, has already been purchased on which to construct a reservoir to hold three hundred million gallons of water at an elevation of 240 feet. From this level, nearly half of the total supply can be distributed by gravity; the rest will be pumped to reservoirs at higher levels.

The total amount of money spent on the work to date is about fifteen million dollars. All construction work so far has been concentrated in the Sierra Nevada region, to get the Moccasin power plant in full operation as early as possible. The revenue from power sales of this plant is expected to bear a large portion of the construction costs. Much preliminary work was required in this section, including the construction of a standard-gauge railroad sixty-eight miles long, and following in a general way the line of the aqueduct to Hetch Hetchy. This road, in addition to carrying the city's freight, is operated as a common carrier, transporting passengers and freight at established rates. When completed, the system will be of greater magnitude than any similar system in the United States, excepting those of New York and Boston.



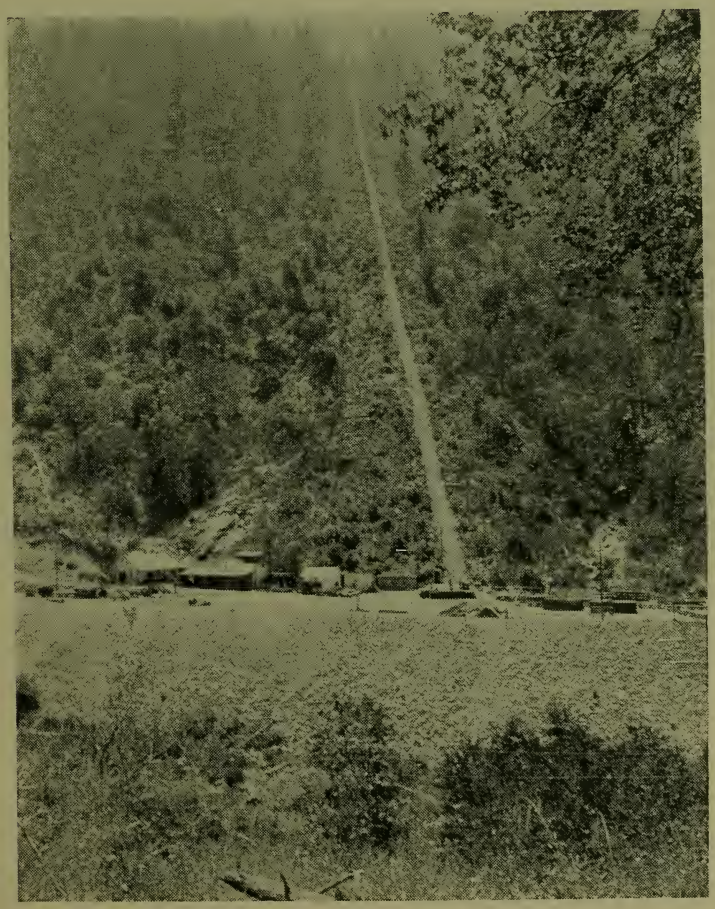
Mikado Locomotive on turntable at Groveland Shop, Hetch Hetchy Railroad.



Hetch Hetchy.

A freight train on the Hetch Hetchy Railroad near Priest.

Mather Sawmill, Hetch Hetchy Project.



Hetch Hetchy.

The San Francisco Water Supply

SAN FRANCISCO has been supplied with water for municipal and domestic purposes by the Spring Valley Water Company, or its predecessor, the Spring Valley Water Works, ever since the year 1865. Prior to that date the city had been furnished with water from wells at first, then from small springs and streams located within the city and county. It early became apparent that no sufficient supply for the growing population could be obtained within the city limits, and as early as 1858 the Spring Valley Water Works commenced acquiring

Richly productive watershed of Pilarcitos in San Mateo Branch of Spring Valley Water Co.

water rights and lands on the Peninsula in San Mateo County. The Pilarcitos Reservoir was built in 1862, the San Andreas Reservoir in 1871, Lake Merced and upper Crystal Springs in 1877 and the Crystal Springs concrete dam in 1888. The first supply from Alameda County, derived from the flow of Alameda Creek at Niles, was brought across the Bay by submarine pipes in 1888, and an additional and larger pipe line across the Bay was built in 1900, putting into use the Pleasanton supply, Calaveras Creek and the Sunol filter beds. Since 1900 no new sources of water have been developed by the Water Company and operations have been confined to the maximum utilization of the sources already developed. To increase the yield of the Calaveras properties, construction work on a dam across the Calaveras Valley was begun in 1913, and while not yet completed, it has progressed to a point where eight billion gallons of water can be stored therein. The average daily consumption of water in San Francisco is in the neighborhood of forty million gallons, and though

the completion of the Calaveras Dam will increase the capacity of the company by about thirty billion gallons, the constantly increasing consumption is fast approaching the limit of the present available supply.

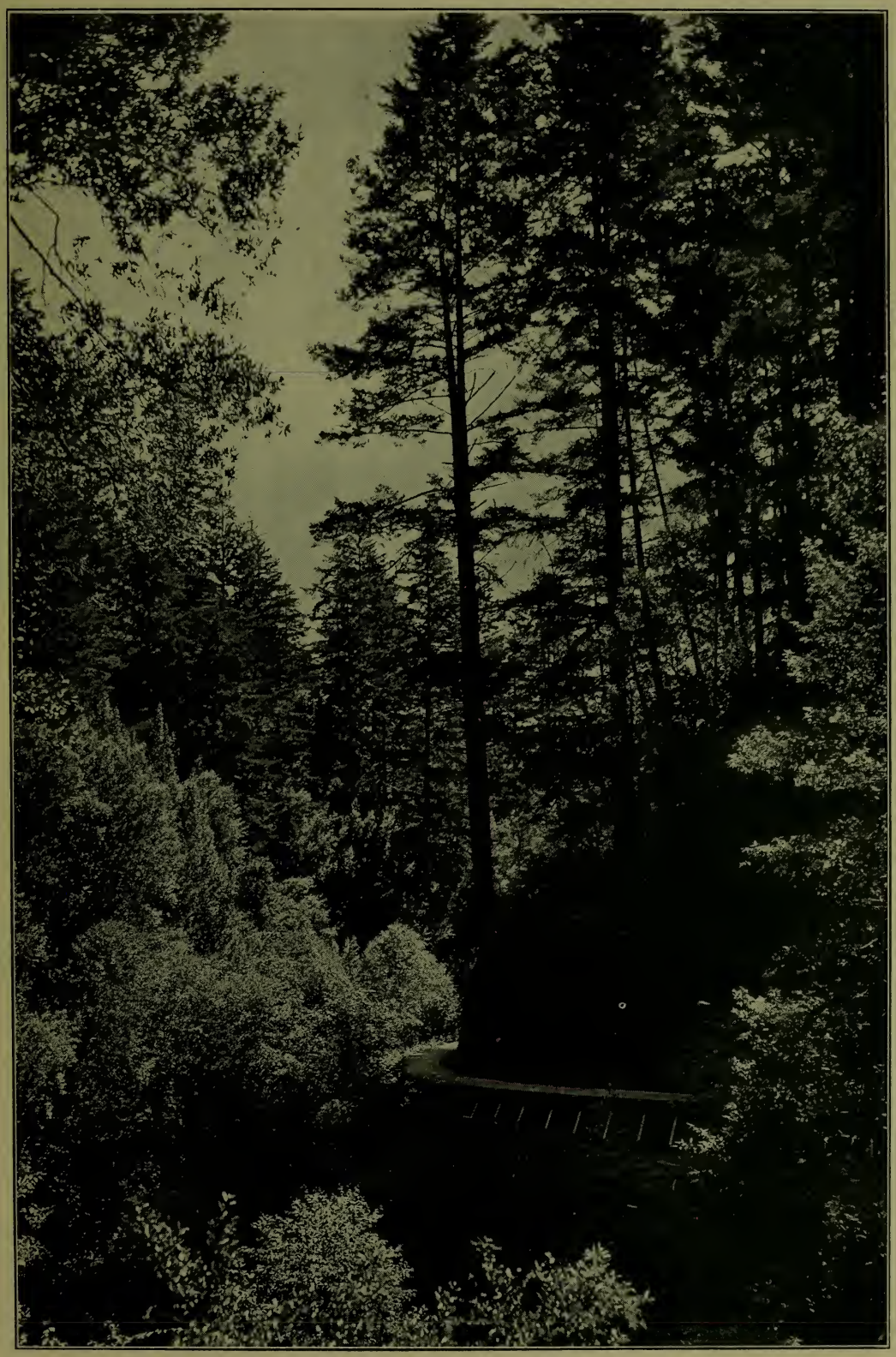
The three main distributing reservoirs are: the Lake Honda Reservoir, at an elevation of 371 feet and having a capacity of forty-five million gallons; the College

Sunol Water Temple, Alameda Branch, Spring Valley Water Company.

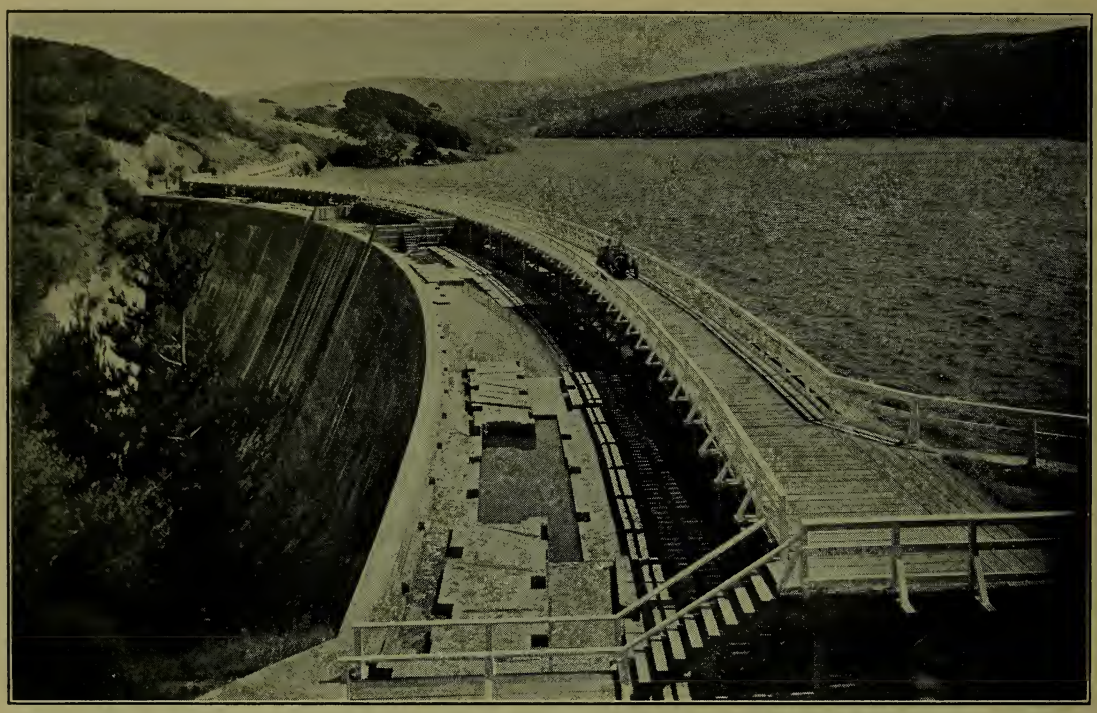
Hill Reservoir, at an elevation of 255 feet and a capacity of fourteen million gallons, and the University Mound Reservoir, at an elevation of 165 feet and a capacity of thirty-seven million gallons. In addition there are a number of smaller, secondary reservoirs and tanks, and the distributing mains consist of approximately five hundred miles of pipe, ranging in size from three inch to forty-four inch inside diameter. The 4400 hydrants connected to the mains of this system are owned and operated by the Fire Department.

San Andreas Dam, San Mateo Branch Spring Valley Water Company.

Crystal Springs Spillway—Reservoir full to overflowing.



Pilarcitos Creek, San Mateo County Branch of Spring Valley Water Company.



Cyclopean Crystal Springs Dam in San Mateo County Branch of Spring Valley Water Company.

Calaveras Dam saves this flow—once it wasted down Alameda Creek.

Pleasanton Station, Headquarters of Artesian Supply, Alameda Branch, Spring Valley Water Co.

City Hall, San Francisco.

SAN FRANCISCO

Panorama of Business Section

Market Street

Ocean Beach

Main Post Office

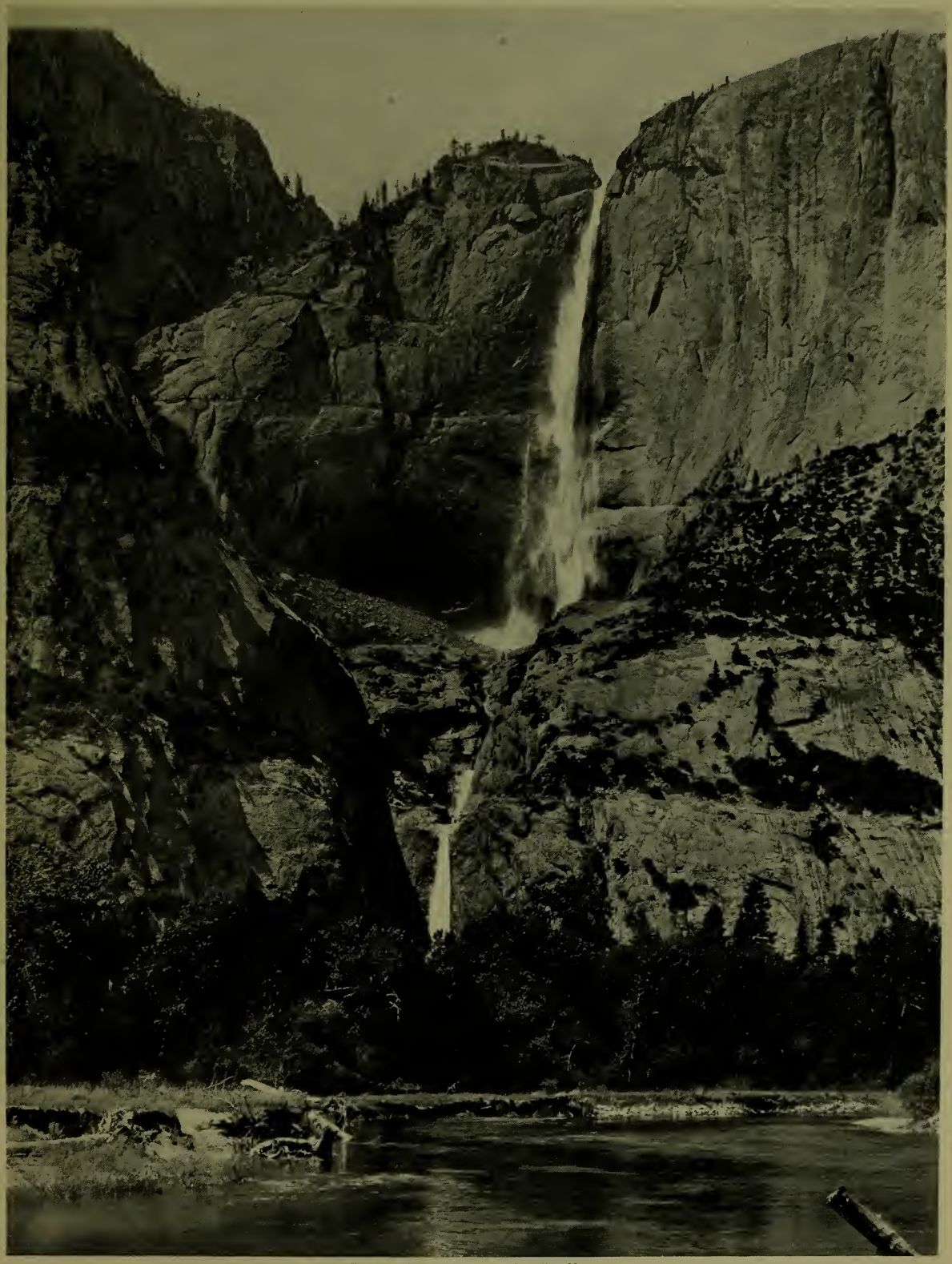
Modern Docks

Chinatown

Custom House

California Views

Sunset at the Golden Gate.

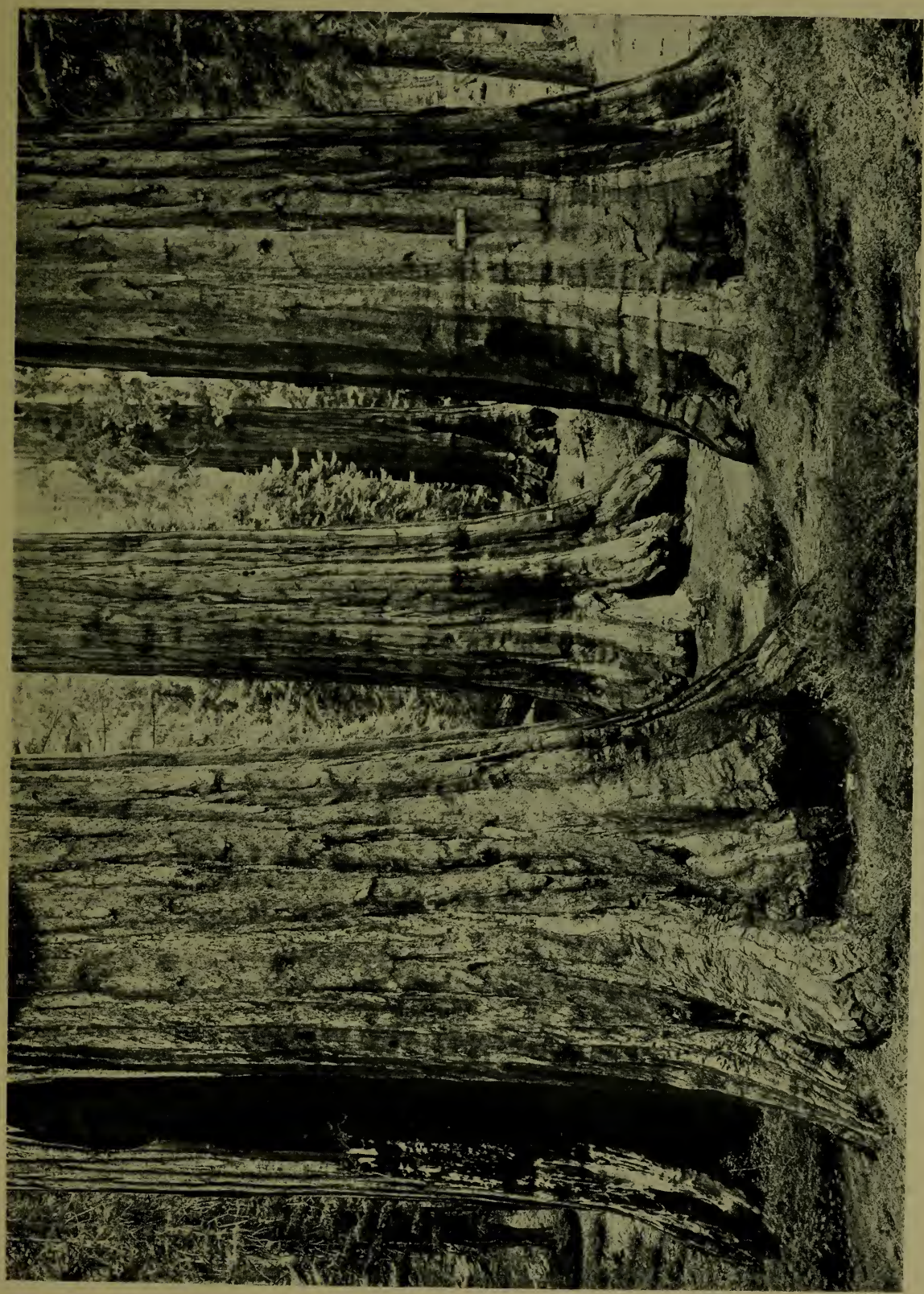


Scene from Yosemite Valley.

Mission, Santa Barbara.

Tea Garden, Golden Gate Park.

Lake Tahoe at Sunset.



Giant California Redwoods.

Foreign Fire Departments

Foreign Fire Departments

PARIS, *France.*—The population is 2,906,472, and its Fire Department is a military organization, being a part of the regular army of that country, but it stands under the authority of the Prefect of Police, and is paid from municipal resources.

Under the command of a colonel, the department, or regiment, is composed of fifty-

two officers and one thousand eight hundred and fifty-five men. The area of the city is divided into twenty-four sections, each having a fire station. The equipment of each station consists of three motor vehicles, one first-aid wagon, one combination pumping engine and hosewagon, and one motor-propelled aerial truck; six of the stations also have motor-propelled salvage wagons.

Four of the stations adjacent to the river Seine are further equipped with a special pumping engine for the protection of vessels and waterfront property. Various other types of appliances are distributed among the different stations. The personnel of each station consists of one officer, three non-commissioned officers and eighteen men, or five non-commissioned officers and twenty-seven men at the river stations. Upon the receipt of an alarm, the section in which the fire occurs responds, and in the event of need request for aid is made to adjoining sections. The vehicular equipment of the regiment consists of twenty-seven first-aid wagons, thirty-one pumping engines, twenty-six aerial ladders, seven salvage wagons, six chiefs' cars and nineteen other vehicles.

Two varieties of rubber-lined canvas hose are in use, one is of 35 mm. diameter in 20 meter lengths, and the other of 70 mm. diameter and 40 meter lengths. 1200 meters of the 70 mm. hose is carried on the first-aid wagon and pumping engines.

The salaries paid to officers and men are based upon the pay of the same rank in the infantry, with a special increase paid by the city, and the men are allowed one day off in every five during the period of compulsory service, and one day off in four for all who voluntarily enlist or who re-enlist after the expiration of their first enlistment. Quarters for married men are furnished at the various stations.

No special bureau of fire prevention exists, but the officers of the regiment act in an advisory capacity to the various authorities having charge of the enforcement of safety regulations. Special details are maintained during performances at theaters and other places of assemblage, from two to seventeen men being required at the different establishments, and two hundred and fifty men are employed in this manner every day.

The Paris Regiment is probably the oldest organized fire department in existence, having been formed as early as 1699; it underwent several transformations; ranked as a battalion of five companies from 1850 until 1866, when it was transformed into a regiment of two battalions, each having six companies; this has remained its formation to the present date.

In the year 1921 the department responded to 8203 alarms of fire.

MONTREAL, *the Capital City of the Dominion of Canada,* has a population of 774,904 and covers an area of fifty square miles.

In the Montreal Fire Department are 248 officers and 657 men, a total of 905. There are forty-five stations and the equipment consists of forty-five hose wagons, thirty-seven ladder trucks, thirteen steam pumps, five combination hose wagons and pumps (auto pumps), one water tower, two siameses, six salvages, seven coal wagons—116 vehicles, 93 of which are horse-drawn and 23 motor.

Two and one-half inch and three-inch rubber-lined cotton hose is used, 1000 feet of which is carried on each hose wagon.

The two-shift system is in operation —day shifts of 10 hours and night shifts of 14 hours; shifts are changed weekly. In addition, 15 days annual vacations are granted.

Fire prevention and inspection service is being maintained by a force of one superintendent, one assistant and twenty-three men.

Last year the department responded to 3882 alarms.

On an ordinary (first) alarm the turnout consists of one district chief, three hose wagons, three ladder trucks and one team pump.

AMSTERDAM, *Holland,* a city of 694,-117 inhabitants, covers an area of 43,133 acres. The Amsterdam Fire Department is under the civil authorities and it consists of thirteen stations, divided over four sections; its personnel is composed of one commander, five officers and 456 men. The apparatus consists of twelve auto turbine motor fire engines, four motor turntable fire ladders, one hand-drawn turbine motor fire engine, two floating steam fire engines, one electrically-driven hose and personnel tenders, three electrically-driven personnel tenders with chemical tanks attached, one electrically-driven steam fire engine, one electrically-driven hose tender, four horse-drawn steam fire engines, two horse-drawn tool wagons, one horse-drawn coal truck, three transport cars and three service automobiles. The Daimler four-cylinder, 60-horsepower, turbine motor fire engines have a capacity of 400 gallons per minute. The motor turntable fire ladders are electrically operated and extend to a height of seventy-eight feet, nine inches. The floating steam fire engines have a capac-

ity of 3400 and 12,000 litre per minute and the horse-drawn fire engines 1000 to 3400 litre per minute.

Linen rubber-lined hose of one and three-quarter inch and two and one-half inch internal diameter is used; all hose is in fifty-foot lengths. Three hundred feet of one and three-quarter inch and 950 feet of two and one-half inch hose is the complement of a motor fire engine. The latter kind is carried on a detachable hose reel.

The department is on a two-platoon basis, the watches alternating in turns of seven, thirty-six, and five hours' duration, with equal periods off duty.

In the last year the department responded to 2732 alarms of fire.

BUENOS AIRES, *capital of the Argentine Republic,* is a city of 1,780,000 inhabitants, and maintains a Fire Department consisting of one chief, six chief officers, thirty-eight officers, thirty-four clerical force and 934 non-commissioned officers and men. The department, a part of the metropolitan police force, is a military organization throughout, and stands under the supervision of the Ministry of the Interior.

The equipment of the department consists of seven auto pumping engines, having a capacity of 120,000 litres per hour; two auto pumping engines having a capacity of 60,000 litres per hour; four auto hosewagons, two aerial ladders of 30 meters length; and two aerial ladders of 27 and 20 meters, respectively; five steam pumping engines of the "Shand Masson" type; one fireboat equipped with pumps capable of delivering 6000 litres per minute; twenty-four hand pumping engines; and twenty-eight vehicles of various types.

During the year 1921 the department attended 536 fires, in addition to a number of calls due to other causes.

HAVANA, *Cuba,* has a population of 363,506, and maintains a Fire Department consisting of 19 officers and 140 men. The Department is divided into four units, three brigades, one machine brigade and one sanitation section. The apparatus consists mostly of Ahrens-Fox equipment, together with several older type steam engines. Cotton rubbed-lined hose of 2¾-inch diameter is commonly used, in fifty-foot lengths; about thirty lengths of this being carried on each pumping engine. Chief officers of the Department are making regular inspections of buildings. During the last year 215 alarms were responded to.

Interior Headquarters Firehouse

Headquarters Firehouse

Interior District Firehouse

VIENNA, *capital of Austria,* having a population of 1,841,326, maintains a Fire Department consisting of 18 officers, 43 masters and 922 men. In addition, there are two physicians, 22 clerical force, and 133 men in the administrative service. The fire force is divided into four companies, stationed in one central fire station, two district headquarters and twelve substations. The apparatus consists of 111 pieces of motor- or electric-driven apparatus and 215 horse-drawn pieces. Rubber-lined hemp hose is commonly used and from 100 to 600 m. of this is carried on the various classes of apparatus. Sixty thousand m. of this hose is available. Officers and men work on a two-platoon basis, twenty-four hours on duty and twenty-four hours off duty, alternating. Quarters for married officers are provided at the central and head quarters stations. A Bureau of Fire Prevention is maintained, and regular inspections of buildings by the uniformed force are made. The Vienna Department is one of the oldest in Europe, having be decree of Empress Maria Theresia been founded in the year 1759, in accordance wherewith forty men and harnessed, horse-drawn hand-pumps, together with water-carts were kept in constant readiness. During the last year the department responded to 2697 alarms of fire.

Drill Tower

Headquarters "Favoriten"

Pumping Engine

ROME, *the Capital of Italy,* covers an area of forty-two square kilometers and has a population of 689,460. The Fire Department is under the jurisdiction of the municipal authorities and is composed of six officers and 254 petty officers and men, divided into four platoons.

Hose of hemp or linen of 55 mm. diameter is mostly used, of which 300 meters is carried upon the auto cars and 500 meters on the auto pumps. The latter also carries some hose of 80 mm. diameter, which is stretched to the proximity of the fire and then siamesed into two streams of 50 mm.

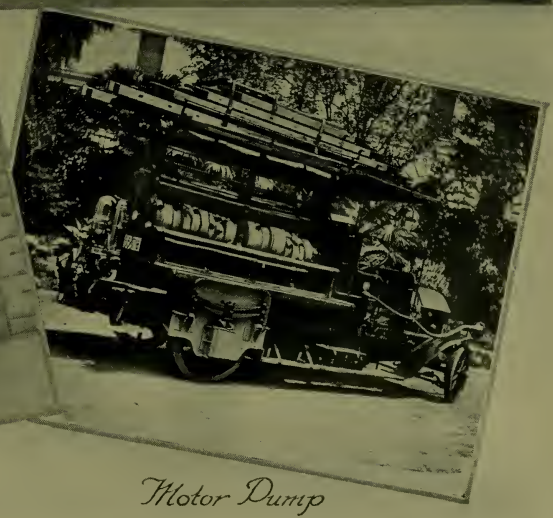
Officers and men are on guard duty on alternate days, but during their periods off duty theater watches and other security services are performed, with extra pay for this work. During municipal celebrations the corps acts as a guard of honor and on these occasions appears in gala uniform. Only single men are recruited for the service, but after five years in the corps a man is permitted to marry.

One-third of the force on guard duty responds to an alarm of fire, and during the last year the corps responded to 469 alarms.

ROME

Headquarters Fire House

District Firehouse



Motor Pump

BERLIN, *Capital of Germany,* has a population of 1,938,527 and covers an area of 6692 ha. (24½ sq. miles).

The Berlin Fire Department (professional) consists of 20 engineers (officers), 170 non-commissioned officers (oberfeuerwehrmaenner) and 911 men. It is under civil authorities and is, in the suburban sections, augmented by a number of volunteer organizations.

The department is divided into six companies.

The equipment consists of seventy-six automobiles, divided into twelve trains, each of which consists of one gasoline pump, one hose and tool wagon, one mechanical ladder and one motor pump; the vehicles are electric-driven; in addition there are five gasoline pumping engines for suburban service, one rescue squad wagon, eighteen tenders, two service wagons, one gasoline practice wagon and one electric-driven practice wagon.

Rubber-lined hemp hose of 72 mm. (2.83 in.) diameter and 43 mm. (1.69 in.) diameter in 20 mm. (65.6 feet) lengths are used, and each train is equipped with ten lengths of the larger and thirty-eight lengths of the smaller hose.

Officers of the department are on duty for 48 hours and off duty 24 hours, while the non-commissioned officers and men work 24 hours on duty and 24 hours off duty throughout.

Fire prevention service is maintained, but no regular inspections of buildings are made.

Last year the department responded to 3492 alarms.

The department was organized in 1851.

JOHANNESBURG, *South Africa,* has a population of 154,413 whites and 138,988 colored, a total of 293,401. It has a Fire Department consisting of eighty men, distributed over five stations.

The apparatus consists of three Merryweather Hatfield motor pumps of 600 gallons capacity and two of 400 gallons capacity, two Dennis motor hose tenders, one Commer and one Reo hose tender, two Ajax motor water towers and escapes of 70 and 90 feet respectively, three Reo ambulances and one Dennis motor lorry.

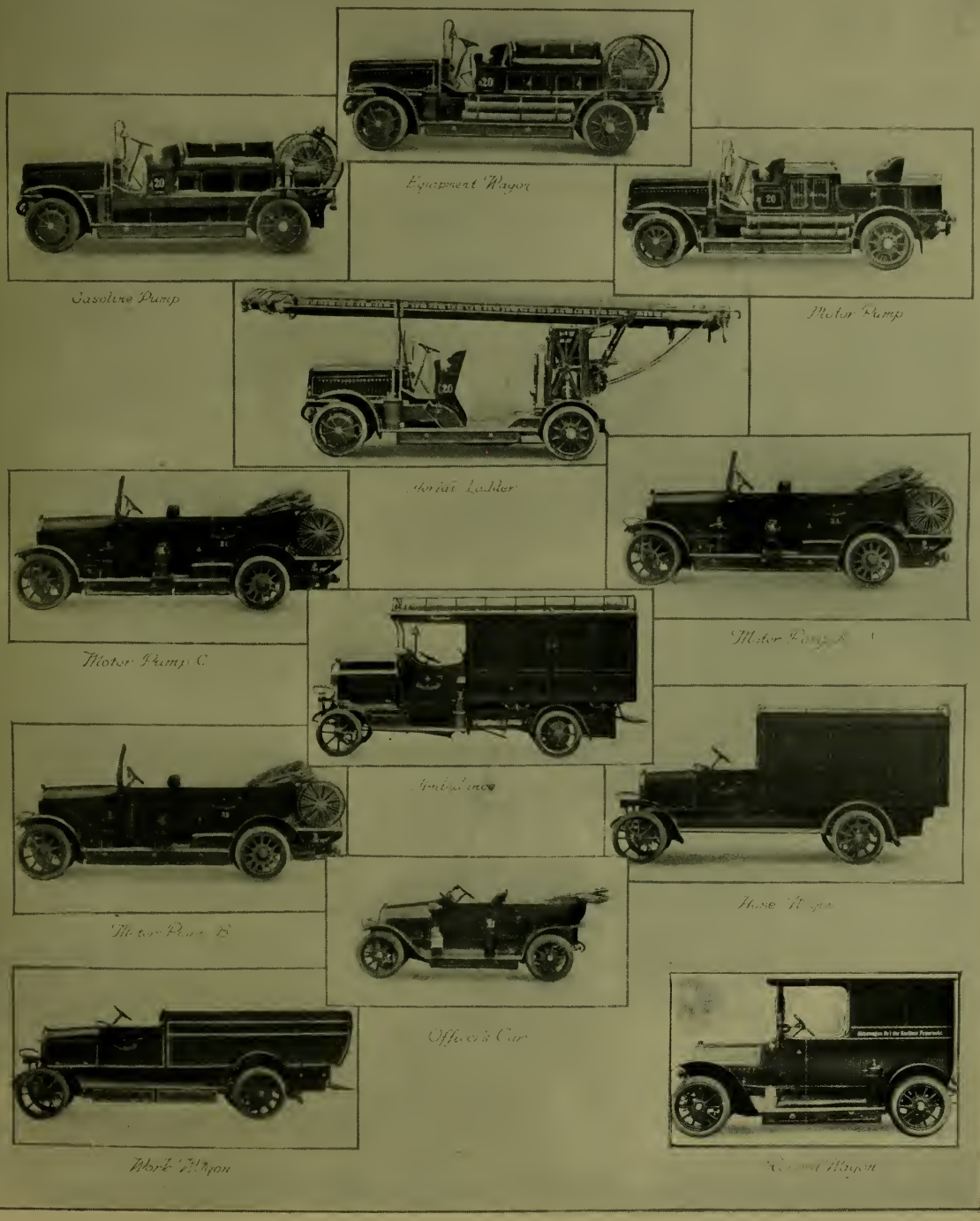
Canvas hose of two and one-half inch diameter is used and approximately 1200 feet of this is carried on each machine.

Officers and men are on duty at all times, excepting one day off in seven; in addition officers are allowed six weeks' vacation with full pay and the men five weeks each. Free medical attention and full pay when sick. Free quarters and uniforms are furnished. Retirement is compulsory at the age of 55, when a pension amounting to one-sixtieth of the total earnings is granted. Free quarters, together with light and water for married members of the force are provided.

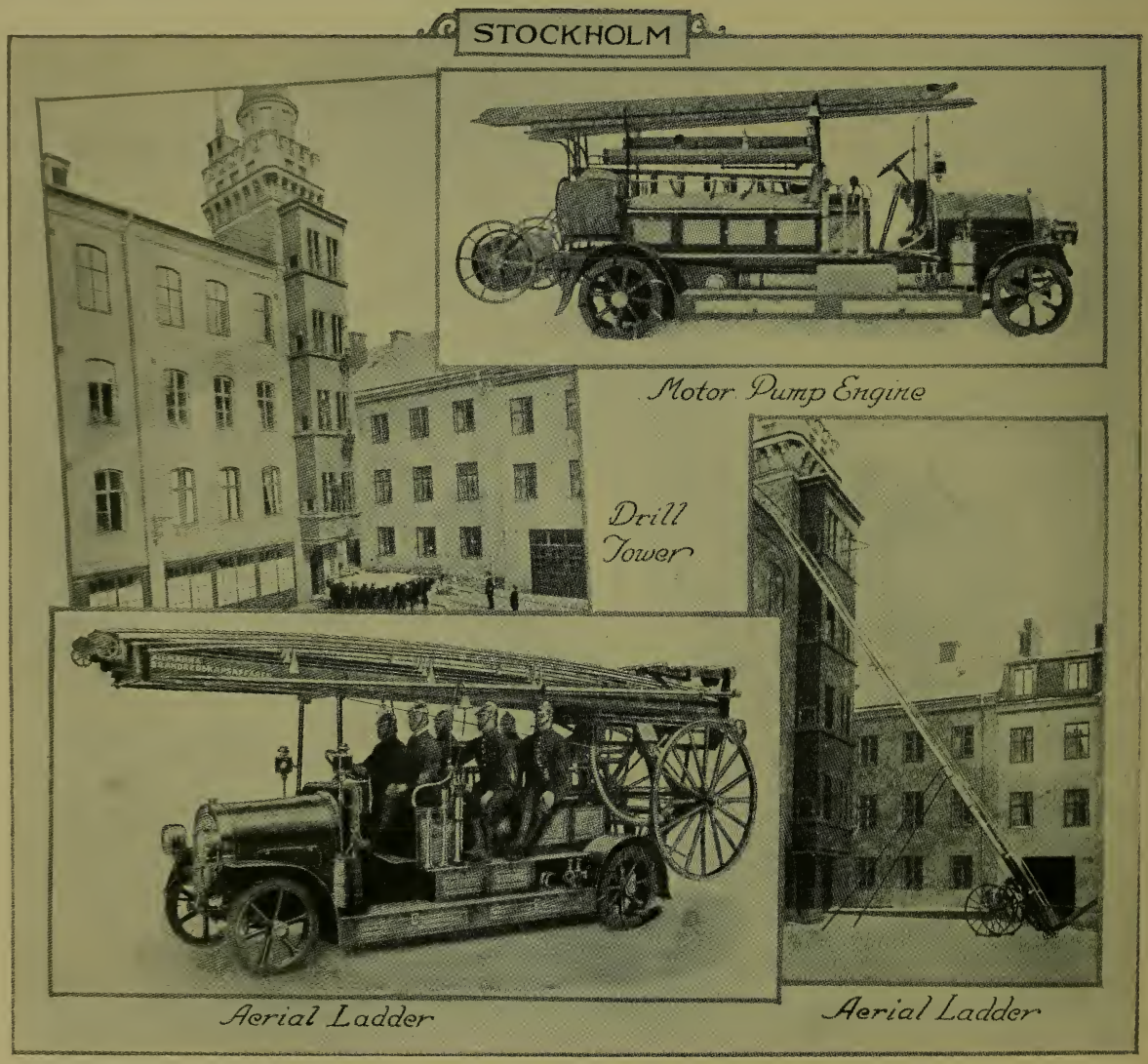
Although no bureau of fire prevention is maintained by the department, regular inspections of buildings are made by three members.

In the city area three machines and twenty men respond to an alarm of fire and two machines and twelve men in the suburban districts.

BERLIN


Equipment Wagon
Gasoline Pump
Motor Pump
Aerial Ladder
Motor Pump C
Motor Pump B
Ambulance
Hose Wagon
Officer's Car
Work Wagon

STOCKHOLM, *Sweden,* has a population of 419,788 and covers an area of about sixty square miles. The Stockholm Fire Department consists of five chief officers, seven station masters, forty foremen and one hundred and ninety firemen. They are distributed over eight stations, one for each metropolitan district, containing from one to thirteen pieces of apparatus; also four suburban stations, where hosecarts are stationed and one man is on watch. The apparatus consists of thirty-two pieces of motor equipment, classed as follows: Ten motor pumping engines; fire aerial ladders; five squad wagons, each of which is equipped with a small pump; one searchlight engine; two wrecking wagons and animal transports; five ambulances; two chiefs' cars; two fireboats, and seventeen divers vehicles. Linen rubber-lined hose of 2½-inch diameter is commonly used, and approximately 200 feet of this is carried on the apparatus.



Officers and men in the department are off duty every third day, with three hours each day for meals. Annual vacations range, according to length of service, from seven to sixteen days.

In 1920 the department responded to 805 calls.

BUDAPEST, *Capital of Hungary,* has approximately one million inhabitants and maintains a fire brigade composed of twelve officers and three clerks and 451 firemen; 55 of these are on constant watch in theaters and other places of public assemblage. The brigade is divided into ten fire stations.

The equipment consists of ten horse-drawn vehicles, nine benzine motors and four electrically-driven automobiles. Two of the fire stations are equipped with motor apparatus, each having a 60-horsepower pumping engine of 1500 litre per minute capacity and a 60-horsepower "Magirus" sliding fire-escape of 30-metre length, electrically operated, and with a small pump of 750 litre per minute capacity mounted thereon. The electrically-driven apparatus is equipped with a pump of 350 litre per minute capacity mounted on a 16-horsepower electromobile. The electrically-driven sliding fire-escape, 26 metres long, is also mounted on a 16-horsepower electromobile. In addition there is a steam

pump of 1700 litres per minute capacity mounted on a 16-horsepower electromobile. 31,420 metres of rubber hose are in service and each piece of apparatus carries from 350 to 500 metres of the same.

The officers of the department are alternating 24 hours on duty and 24 hours off duty, while the men receive 24 hours off duty after each 48 hours of service. A fire watch is maintained in all theaters and other places of amusement, consisting of from one to six men. This service is performed by the men who are off duty and the daily average of this type of duty is 80 men. No special fire prevention bureau is maintained, but the officers of the brigade act as experts and advisors to the district counsels in all matters dealing with fire hazards.

The Budapest fire brigade in its present form was organized in 1870, and in the year 1921 it responded to 778 alarms of fire.

LONDON, *England,* the largest city of the world, having a population of nearly four and a half million and covering an area of one hundred and seventeen square miles, maintains a fire brigade of 1953 uniformed staff and 153 clerical and mechanical force.

The brigade is under the authority of the London County Council and is one of the oldest organizations of its kind, having been organized in the year 1866. There are sixty-four fire stations and three river stations, and there are eighty-seven motor pumps, seventy-nine motor escape vans, ten turntable ladders, six motor lorries, seven motor tenders, one motor canteen van and four river floats.

Two and three-quarter inch rubber-lined canvas hose in hundred-foot lengths is used, eight hundred feet of which is carried on the motor pumps and five hundred feet on the motor escape vans. About eighty miles of this hose is in service.

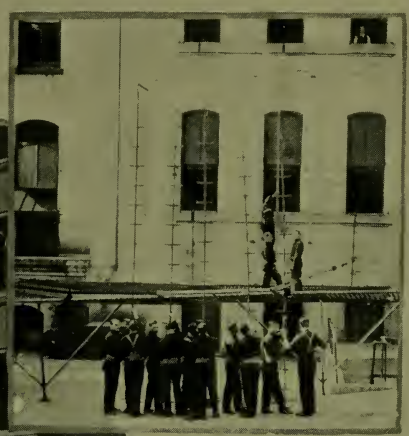
The London brigade operates under the two-shift system, alternating one week day-shifts of nine hours and the next week night-shifts of fifteen hours, with one day off additional every week.

Fire prevention and building inspection work is under the jurisdiction of the brigade and protection service is furnished to theaters, music halls and places of public entertainment.

At least two motor fire engines and one motor fire escape respond to an alarm of fire, and during the last year the brigade answered 7855 alarms.

NEW YORK

Drill School



Drill School

Drill Tower

Oil Burning Fire Tug ~ "John Purroy Mitchel"

New York Fire Department

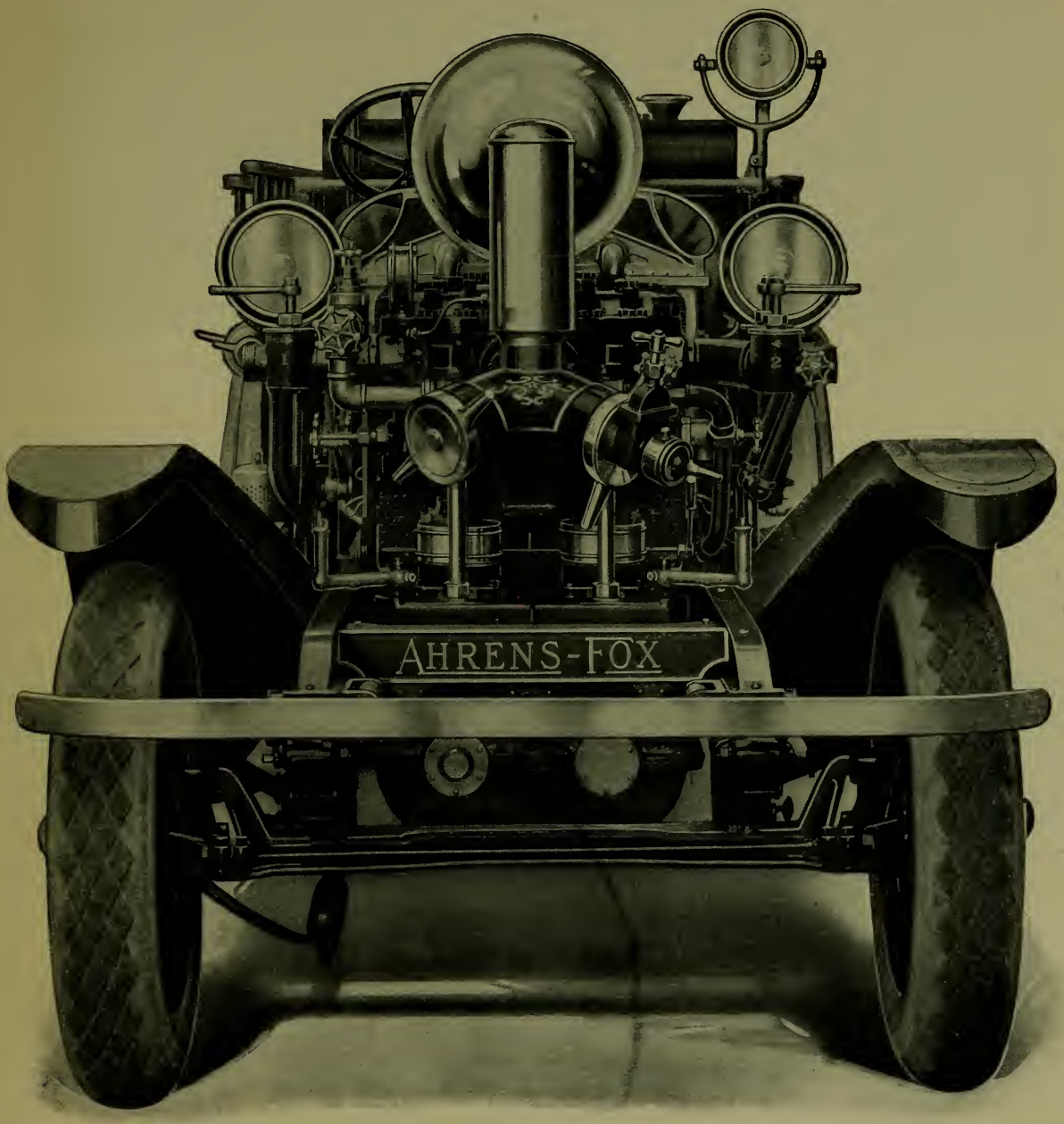
NEW YORK, the largest city of the world, having a population of six million people, maintains a Fire Department of 307 companies, divided as follows: ten fireboats, six double engine companies (consisting of two engines and two hosewagons), seven double companies (consisting of one engine, one hosewagon and one high-pressure hosewagon), two triple companies (consisting of two engines, two hosewagons and one hook and ladder truck), six double hook and ladder companies (consisting of two hook and ladder trucks), 179 single engine companies, 94 single hook and ladder companies, two hose companies, and one rescure company. The personnel consists of 6009 officers and men. There are 697 pieces of apparatus, 665 of which are motor- and 32 horse-drawn. Cotton rubber-lined hose of 3-inch and 2½-inch diameter is commonly used, and in the high-value district the first alarm assignment consists of four engine companies, one deputy chief, two battalion chiefs, two fireboats (if on the waterfront) two hook and ladder companies. Officers and men work under the provisions of the two-platoon system. A seperate Bureau of Fire Prevention is being maintained. During the last year the New York Department responded to 18,363 alarms of fire.

George Washington Fire Engine

This venerable fire engine was presented to the Alexandria Volunteer Fire Company by George Washington while he was an active member and living at Mt. Vernon, twenty miles distant. The Alexandria Volunteer Fire Company was organized in 1774 and is still in existence. A custodian is on hand at all times to see that the old engine is well cared for.

Advertising Section

The Engine with the Fire-Fighting Face



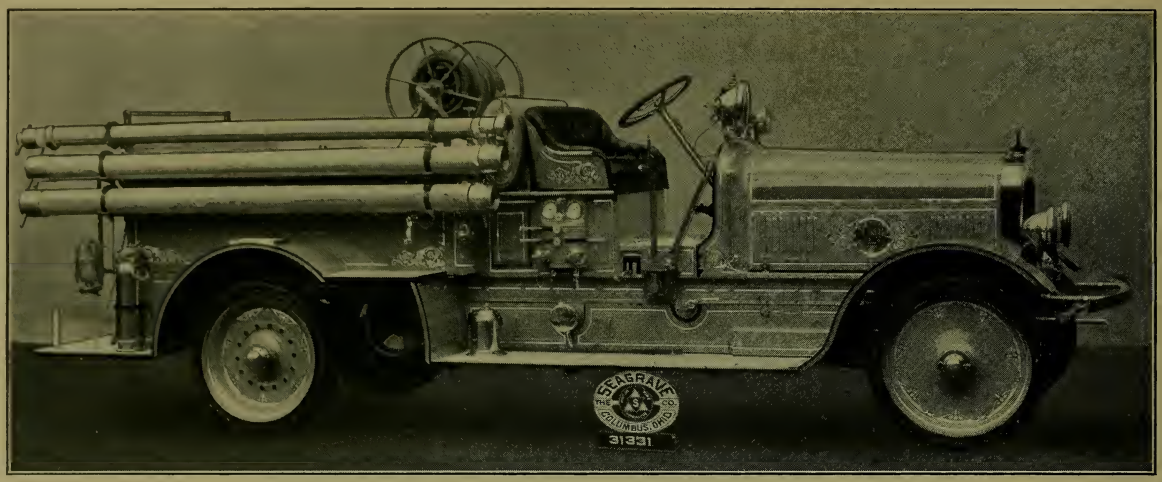
When five more Ahrens-Fox Units were recently added to the Baltimore City Fire Department, the choice was based upon the splendid record achieved with Ahrens-Fox apparatus in Baltimore. This experience representing a period of many years' service and real merit—rather than price—was the prime consideration.

AHRENS-FOX FIRE ENGINE COMPANY

Principal Office and Works — Cincinnati, Ohio

EASTERN REPRESENTATIVE
J. A. PRESCOTT
FISK BUILDING, NEW YORK

NEW ENGLAND REPRESENTATIVE
CARLOW AUTO COMPANY
TAUNTON, MASS.



One of the 128 Seagrave Centrifugal Pumping Engines Protecting California Cities.

"SAN FRANCISCO KNOWS HOW"

CENTRIFUGAL PUMPING ENGINES IN SERVICE IN CALIFORNIA

SAN FRANCISCO	29
LOS ANGELES	20
SAN DIEGO	11
PASADENA	6
OAKLAND	4
Alameda	3
Bakersfield	3
Benicia	1
Berkeley	1
Burbank	1
Calexico	1
Chico	1
Colton	1
Coronado	1
Fresno	2
Fullerton	1
Hollister	1
Huntington Beach	1
Huntington Park	1
Livermore	1
Lodi	1
Long Beach	3
Menlo Park	1
Modesto	1
Monrovia	1
Monterey	1
Mare Island Navy Yard, U. S. Gov't	1
Napa	1
Oxnard	1
Piedmont	1
Pittsburg	1
Richmond	1
Sacramento	1
Redlands	1
Redwood City	1
San Jose	2
San Leandro	1
San Luis Obispo	1
San Mateo	1
Santa Ana	1
Santa Barbara	1
Santa Monica	2
South Pasadena	2
Stanford University, Palo Alto	1
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Stockton	2
Vacaville	1
Vallejo	1
Visalia	2
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J. F. CRIBBINS, Branch Mgr.

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The Name Behind the Hose

When you buy fire hose, deal with the manufacturer who is proud of his product and trade marks each length as a sign that he stands solidly behind it.

Paragon and the other well-known brands of Eureka manufacture have built up a reputation for dependability and long service in the past 45 years that is unequalled by any other make of hose.

There is no doubt about the hose being right when it bears the name EUREKA.

United States Rubber Company

EUREKA FIRE HOSE DEPARTMENT

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BRANCHES:

Atlanta, Boston, Chicago, Columbus, Dallas, Kansas City, Los Angeles, Minneapolis, New York, Philadelphia, Seattle, Syracuse

E. L. RAINS, *Manager* Mined at Rains, Utah

HI-HEAT COAL

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MOST HEAT FOR MONEY

Hi-Heat Coal Shows Hi-Heat Test

Buy an American coal---Help keep American miners at work---
Help prevent strikes.

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Episodic Scenes
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Ever Filmed

"The Discard"

with the same great cast
that made "In the Name of the Law"
an international sensation

Rushed to Convention Headquarters, San Francisco, from the laboratories of the R-C Studios in Hollywood for the entertainment of delegates of the International Association of Fire Engineers and Pacific Coast Fire Chiefs.

SEE OFFICIAL PROGRAM FOR TIME AND PLACE OF SHOWING

Courtesy of

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THOS. J. COLEMAN
MANAGER

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Kellogg telephones, switchboards, police and fire alarm systems, intercommunicating systems are the most economical on the market.

The transmission of Kellogg is of the highest and the simplicity of the apparatus results in freedom from trouble.

Let us estimate on your telephone needs. Our engineering department is at your service.

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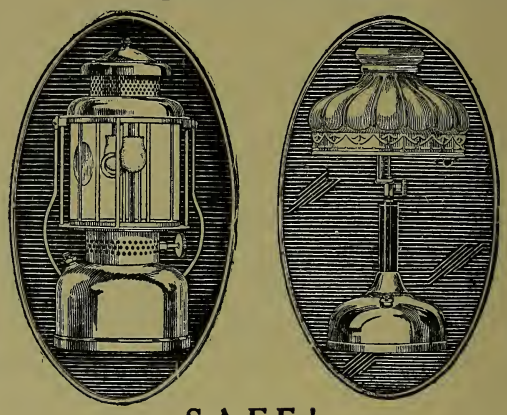

SAFE!

1. Can't spill fuel even if tipped over.
2. Can't be filled while lighted.
3. Built of brass and steel; heavily nickled, inspected, tested and guaranteed.
3. Give 300 candle-power of pure white light.
5. Used in more than a million homes; sold by more than 30,000 dealers.

Write for Particulars.

The Coleman Lamp Company

Largest Manufacturers of Gasoline Lamps, Lanterns and Lighting Plants in the World

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Factory Branches: Philadelphia, Chicago, Los Angeles
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A PACIFIC REDWOOD TANK

—and the assurance of protection through your Sprinkler system

Throughout California, hundreds of buildings and industrial plants are protected with Pacific Fire Tanks.

Write for information.

PACIFIC TANK & PIPE CO.

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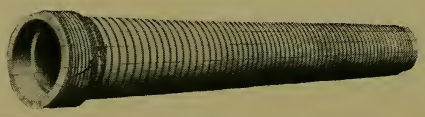

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BANK, OFFICE and STORE FIXTURES

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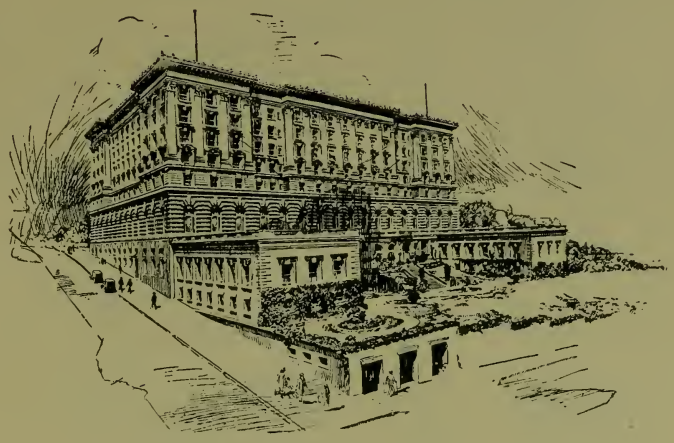

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Crowning Nob Hill

High up on Nob Hill, away from the noise and hurry of the city, and yet within five minutes' ride of the heart of the financial, shopping and theatrical centers of San Francisco, the Fairmont Hotel appeals to discriminating people.

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Eddy at Market

We Cannot Show All the Pictures,
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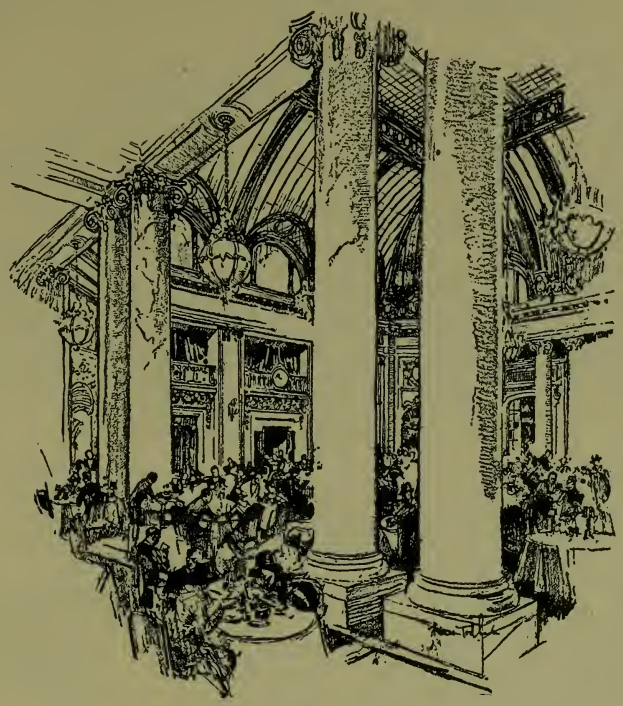

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Management
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9 BIG RIDES—100 CONCESSIONS

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The City is now extending the Ocean Esplanade 1,100 feet and grading Sutro Heights Hill. Come out and see this gigantic work going on!

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Take Municipal Car—Geary "B" or No. 5 or No. 7

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Specially constructed and adapted for

Fire Alarm Systems:
Automatically and instantly sounding Box Numbers; Radius, 3 to 8 miles.

Motor Fire Apparatus and Automobiles:
With far-reaching and impelling note.

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Operating from a button or switch or automatically if the wires are tampered with.

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Signalling type-radius five miles.

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Adjustable to time clock or operated by switch.

Heath Automatic Sirens have an individuality and sound a note of command which punches through all other noises.

The mechanism is sturdy, weather - proof, fool - proof, practically frictionless (having but few wearing moving parts), and is built for both alternating or direct current circuits.

Ideal Signalling Instruments Long and Urgently Needed

For catalog and full information address

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SMOKE EATERS

Where there's smoke, there's fire—and where there's fire, you are sure to find American-La France Apparatus in the foreground.

When there is a hard run over rough streets, or a steep uphill pull, American-La France Motor Apparatus is sure to arrive first at the fire. Every part is built oversize to stand strain and the motor develops more than enough power in proportion to the weight carried to enable it to overcome every obstacle.

At the fire, no matter how long the job of pumping at capacity, American-La France Apparatus is at its best. This is proved by the many records which it has established.

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FIRE DETECTION SERVICE

Endorsed by
Fire Chiefs in all cities
where operated

The Automatic Alarm System Which Feels Fire. Successful on the Pacific Coast since 1914. Operating in 20 cities; connected direct to Municipal Fire Alarm Systems.

Where Fire Detection Service Protects Property, the alarms are received so quickly after fire starts that 98 per cent are extinguished *by firemen* with hand extinguishers.

Demonstrated at the I. A. F. E. Golden Anniversary Congress, San Francisco Municipal Auditorium, by

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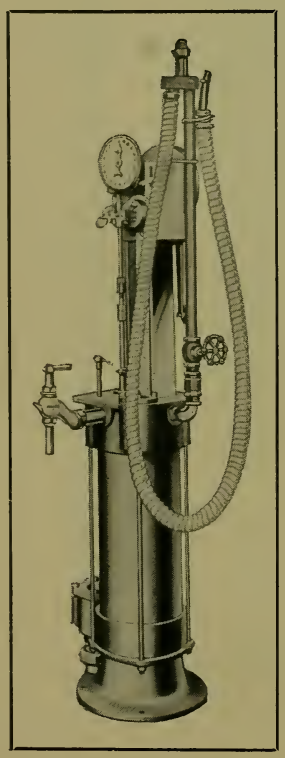

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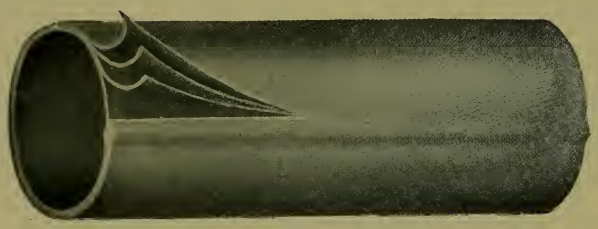
Cotton Rubber Lined Fire Hose

CALENDERED LININGS

American's Precaution Plan Hand Made Hose Linings



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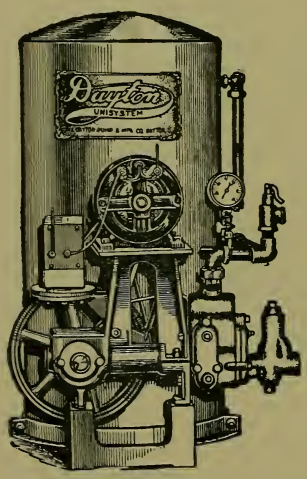
A Complete $139.00 Water System



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FRESH RUNNING WATER

for bathroom, kitchen and laundry, the same as city service---in your home.

We will gladly furnish complete information and catalogues upon request

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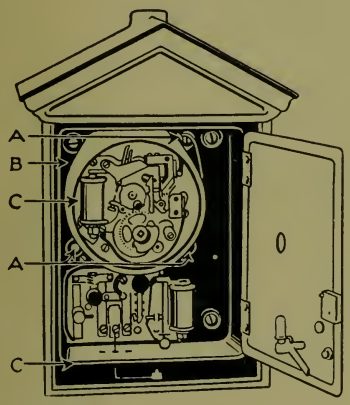
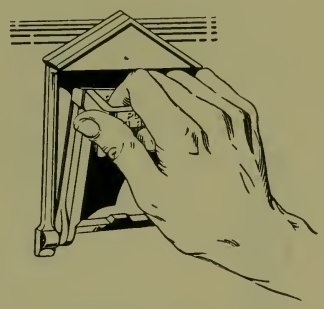
Porcelain Steel
Peerless Box
with
Quick Action Door

SPEED UP THE ALARM



Porcelain Steel inner cases

Two years' time and $50,000 have been spent to develop this box to give your city better fire alarm protection. The new **Quick Action Door** cuts down the time consumed in sending in the alarm. The pressed steel inner cases covered with three coats of porcelain enamel give double the protection against lightning and high potential currents.



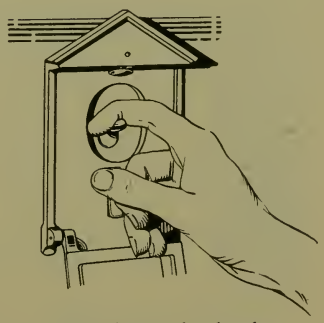
Two simple operations—pull down the handle and—

Why not honorably retire your old boxes

This new box is displayed at our exhibition at the convention. Make it a point to examine it thoroughly before you leave. Our representatives at the convention, our San Francisco office or any of our agencies will be pleased to give more information about this box.

The Gamewell Company

A BOX A BLOCK



Pull down the hook

Greetings to the Chiefs

at the Beach

GEORGE HART *and* MARTIN KLUGE

FIRE DEPARTMENT ITEMS

Pyrene

The Pyrene Extinguisher

Every piece of fire apparatus should carry a few Pyrenes. It is the only safe extinguisher to use on electrical fires, and the Pyrene is wonderfully efficient in extinguishing fires of an oily nature. No other type extinguisher will put out a calcium carbide fire.

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The Guardene Non-Slop Extinguisher

Capacity, 2½ gallons. Especially designed for motor fire apparatus and boats. The chemicals will not mix or slop out through hose, no matter how much the extinguisher is shaken.

The Accurate Pump Tank

Capacity, 5 gallons. An excellent extinguisher for brush fires. Can be used with plain water or with non-freezing solution.

Accurate Pump Tank

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For Sulphuric Acid. No fire house should be without one of these syphons.

Acid Syphon

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To the Fire Chiefs

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Jewelers and Silversmiths

Established 1852

POST STREET AT GRANT AVENUE

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A Slate-Surfaced Shingle That You Can Endorse-FLEXSTONE

Be sure the roofing and shingles you recommend will stand the blow torch test.

THE position of the slate surfaced shingle as a fire-safe roofing has always been questionable—notwithstanding the fact that it has been classified as a "fire-resistant".

This fact must be an embarrassment to all who are interested in fire-prevention.

Realizing this and encouraged by an ever-growing demand for a popular priced Asbestos Shingle, Johns-Manville have produced a slate-surfaced shingle that is different from all others. It is called Flexstone.

Flexstone Shingles are built from a base of asbestos rock fibre and embellished with crushed slate in two artistic shades — a cool green and a rich warm red. There is not one particle of inflammable felt in them. Their fire-safety has won them a rating above that of ordinary slate - surfaced composition shingles from Underwriters' Laboratories, Inc. (Class B).

Yet we are able to offer Flexstone Shingles at a price within a few cents of the ordinary composition shingles. So you need have no hesitation suggesting Flexstone Shingles as a truly fire-safe roof for even the most modest home.

Visit our exhibits at Booths Nos. 77 and 78

Through— Asbestos and its allied products — INSULATION, BRAKE LININGS, ROOFINGS, PACKINGS, CEMENTS, FIRE PREVENTION PRODUCTS

Branches in 57 Large Cities

JOHNS-MANVILLE INC.

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Market St. between 5th and 6th

Showing the Best First
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MANUFACTURERS OF

The "Elk" Fire Department Pipes and Nozzles

Firemen's Pet Pipe
With Ladder Hook, Stream Shaper and Elk Shut-off Nozzle Attached

Greets old friends and hopes to make new ones at San Francisco. See our samples in space No. 47, Convention Hall.

Elk Controlling and Shut-off Nozzle
This nozzle operates on a stream from 1⅛-inch to a complete shut-off. The upper part of the nozzle has a series of holes which act as a cushion for the stream and will carry the solid stream a longer distance.

We are always glad to ship

Elkhart Nozzles on Approval

Thorough tests will prove their merits

Send for Catalog and Circulars

New York City again purchases

EMPIRE HOSE

in June and July

There must be a reason for purchasing again this year
"Be sure Empire is asked to bid"

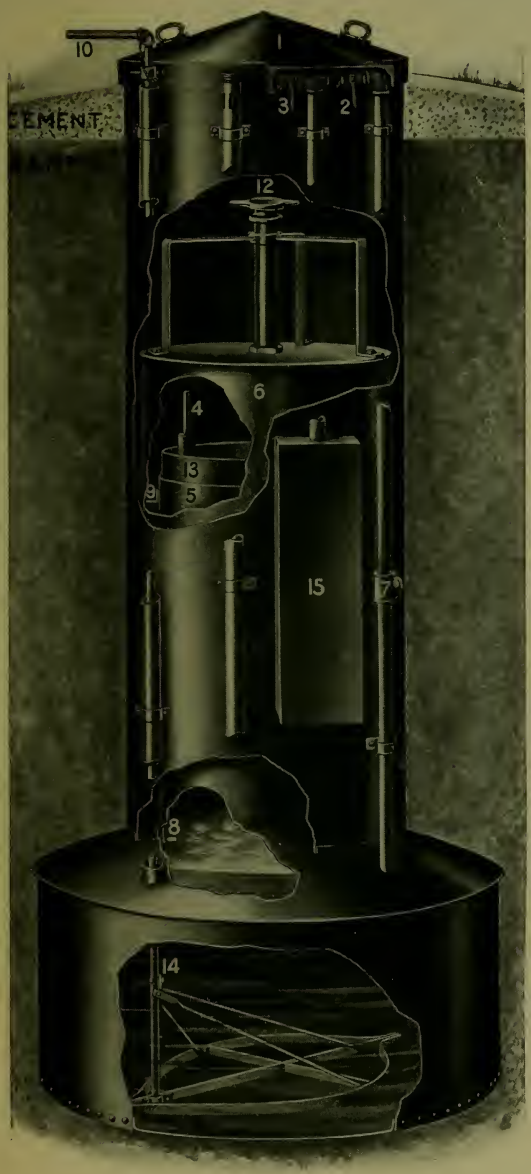
EMPIRE FIRE HOSE

Factories: Trenton, New Jersey

Phelps Pit Generators

for Lighting, Cooking, Ironing, Water Heating

— has no equal — *— reserve carbide hopper —*



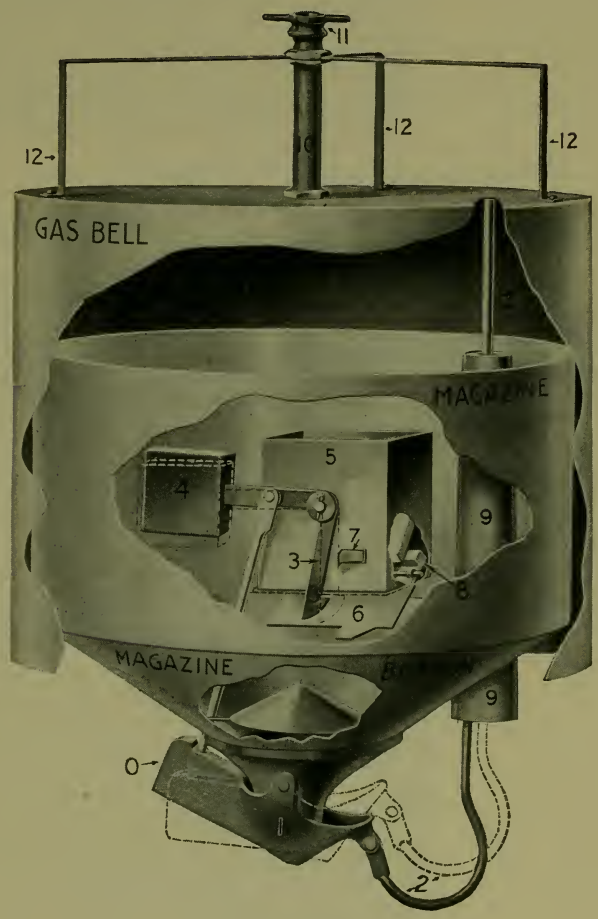


Figure 5 shows within the Magazine a hopper containing a RESERVE SUPPLY OF CARBIDE which is automatically discharged into the Magazine when the main supply of carbide becomes exhausted.

As this operation takes place, a momentary dimming of the lights indicates that the machine should be recharged the next day.

WE OWN BASIC PATENT. INFRINGERS WILL BE PROSECUTED WITHOUT NOTICE.

The Generator for Service, Economy, Safety and Convenience.

We are pioneers in the manufacturing of Carbide Lighting Generators.

Phelps Pit authorized by the National Board of Fire Underwriters.

We offer an automatic carbide generator of unquestioned merit at a price guaranteed to be less than that charged by any other concern in America manufacturing reputable generators.

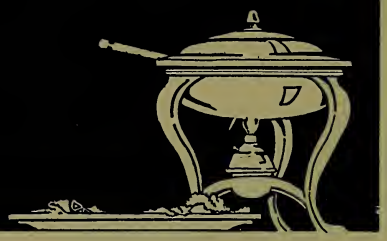
PHELPS MANUFACTURING COMPANY

GENEVA - - ILLINOIS

The States Restaurant

Market at Fourth

ABALONE OUR SPECIALTY



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Fire and Wharf Hydrants

Hose Valves — Couplings — Nozzles — Siamese —

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Reinhart Lumber & Planing Mill Co.

Millwork -- Sash and Doors -- Built-in Fixtures

Office and Planing Mill, 17th and Kansas Streets

Yards:

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Phones Market 1057-1058 — San Francisco, Calif.

Burned for Nearly an Hour!
No Explosion Occurred!!

Here is probably the most severe test ever given any kind of a gasoline pump and the test was made with the famous

Fry Guarantee Visible Pump

the first one approved by the Underwriters Laboratories. Send for the remarkable affidavit covering this unusually severe safety demonstration.

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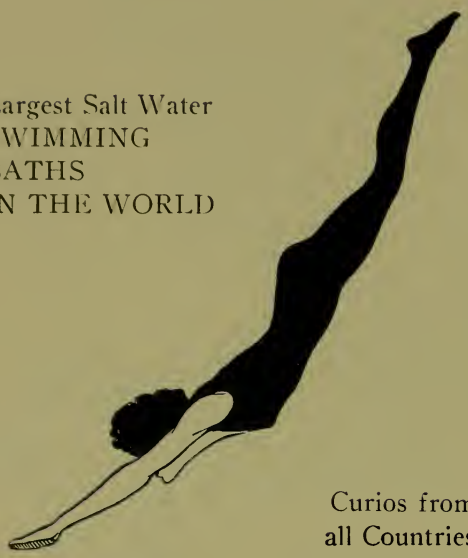

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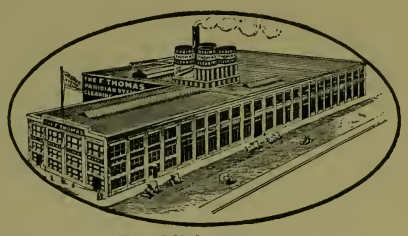

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